ORDER NO. KM40309212C3

Service Manual

Telephone Equipment

KX-TCD510ALV / KX-TCA151AZV

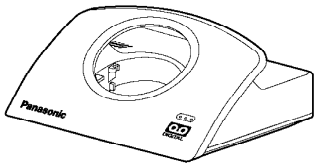
Digital Cordless Answering System

Violet Version

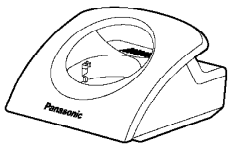
(for Australia)

Caller ID Compatible

KX-TCA151AZV
(HANDSET)



KX-TCD510ALV
(BASE UNIT)



(CHARGER UNIT)

Configuration for each model

Model No	Base Unit	Handset	Charger Unit
KX-TCD510	1	1(TCA151)	
KX-TCA151		1	1

KX-TCA151 is also an optional accessory, which contains a handset and a charger.

SPECIFICATIONS

SPECIFICATION

Standard:	DECT= (Digital Enhanced Cordless Telecommunications) GAP=(Generic Access Profile)
Number of channels:	120 Duplex Channels
Frequency range:	1.88 GHz to 1.9 GHz
Duplex procedure:	TDMA (Time Division Multiple Access)
Channel spacing:	1728 kHz
Bit rate spacing:	1152 kbit/s
Modulation:	GFSK= (Gaussian Frequency Shift Keying)
RF Transmission Power:	approx. 250 mW
Voice coding:	ADPCM 32 kbit/s
Operation range:	Up to 300 m outdoors, Up to 50 m indoors
Analog telephone connection:	Telephone Line

Power source:	AC Adaptor (230 V - 240 V AC, 50/60 Hz)
Power consumption, Base Unit:	Standby: Approx. 3.5 W/Maximum: Approx. 9.2 W
Charger Unit:	Standby: Approx. 2.3 W/Maximum: Approx. 6.8 W
Battery life, Handset (if batteries are fully charged):	Stand-by: Up to 120 hours (Ni-MH) Talk: Up to 10 hours (Ni-MH)
Operating conditions:	5 - 40 C, 20 - 80 % relative air humidity (dry)
Dimensions, Base Unit (D x W x L):	58 mm x 128 mm x 105 mm
Dimensions, Handset (D x W x L):	143 mm x 48 mm x 32 mm
Dimensions, Charger Unit (D x W x L):	84 mm x 86 mm x 60 mm
Weight, Base Unit:	about 200 g
Weight, Handset:	about 125 g
Weight, Charger Unit:	about 113 g
Connection jack:	Australian Plug

Specifications are subject to change.
The illustrations used in this manual may differ slightly from the original device.

IMPORTANT INFORMATION ABOUT LEAD FREE, (PbF), SOLDERING
If lead free solder was used in the manufacture of this product the printed circuit boards will be marked PbF.
Standard leaded, (Pb), solder can be used as usual on boards without the PbF mark.
When this mark does appear please read and follow the special instructions described in this manual on the use of PbF and how it might be permissible to use Pb solder during service and repair work.

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⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

When you note the serial number, write down all 11 digits. The serial number may be found on the bottom of the unit.

Panasonic

1. ABOUT LEAD FREE SOLDER (PbF: Pb free)

Note:
In the information below, Pb, the symbol for lead in the periodic table of elements, will refer to standard solder or solder that contains lead.
We will use PbF solder when discussing the lead free solder used in our manufacturing process which is made from Tin (Sn), Silver (Ag), and Copper (Cu).
This model, and others like it, manufactured using lead free solder will have PbF stamped on the PCB. For service and repair work we suggest using the same type of solder although, with some precautions, standard Pb solder can also be used.

Caution

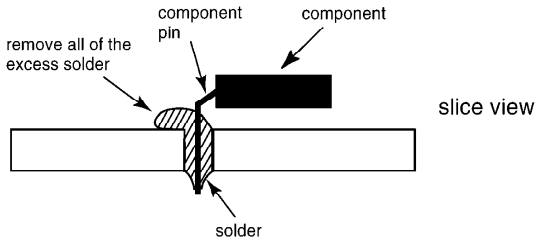
- PbF solder has a melting point that is 50°F ~70°F (30°C ~ 40°C) higher than Pb solder. Please use a soldering iron with temperature control and adjust it to 700°F ± 20°F (370°C ± 10°C). In

case of using high temperature soldering iron, please be careful not to heat too long.

- PbF solder will tend to splash if it is heated much higher than its melting point, approximately 1100°F (600°C).

- If you must use Pb solder on a PCB manufactured using PbF solder, remove as much of the original PbF solder as possible and be sure that any remaining is melted prior to applying the Pb solder.

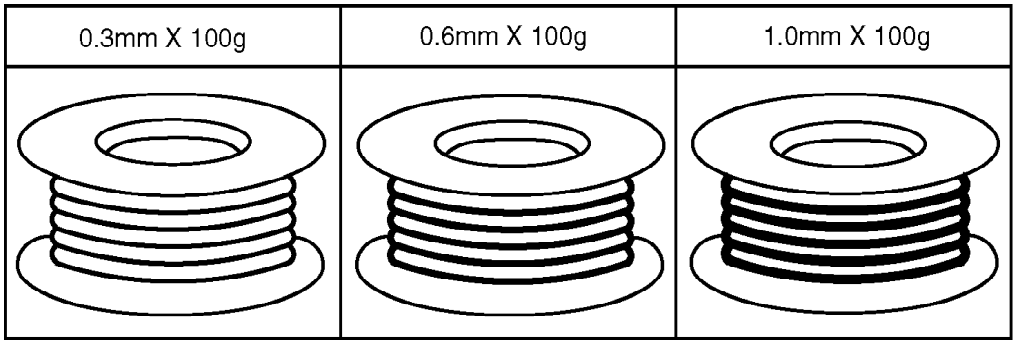
- When applying PbF solder to double layered boards, please check the component side for excess which may flow onto the opposite side (See the figure below).



1.1. Suggested PbF Solder

There are several types of PbF solder available commercially. While this product is manufactured using Tin, Silver, and Copper (Sn+Ag+Cu), you can also use Tin and Copper (Sn+Cu) or Tin, Zinc, and Bismuth (Sn+Zn+Bi). Please check the manufacturer's specific instructions for the melting points of their products and any precautions for using their product with other materials.

The following lead free (PbF) solder wire sizes are recommended for service of this product: 0.3mm, 0.6mm and 1.0mm.



1.2. How to recognize that Pb Free solder is used

1.2.1. Base Unit PCB

(Component View)

(Flow Solder Side View)

Note:
The location of the “PbF“ mark is subject to change without notice.

1.2.2. Handset PCB

(Component View)

(Flow Solder Side View)

Note:
The location of the “PbF“ mark is subject to change without notice.

1.2.3. Charger Unit PCB

Note:
The location of the “PbF“ mark is subject to change without notice.

2. FOR SERVICE TECHNICIANS

ICs and LSIs are vulnerable to static electricity.

When repairing, the following precautions will help prevent recurring malfunctions.

1. Cover the plastic parts boxes with aluminum foil.

2. Ground the soldering irons.

3. Use a conductive mat on the worktable.

4. Do not touch IC or LSI pins with bare fingers.

3. CAUTION

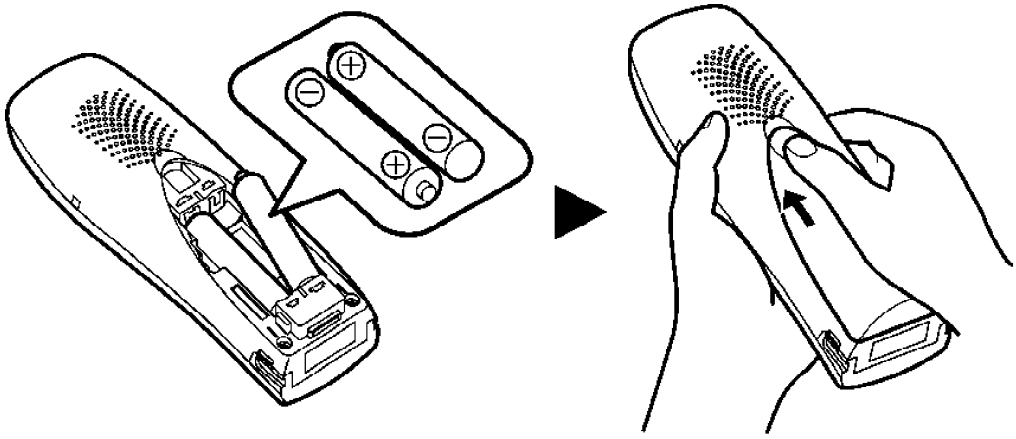
Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommendenced by the manufacturer.
Dispose of used batteries according to the manufacture’s Instructions.

4. BATTERY

4.1. Battery Installation

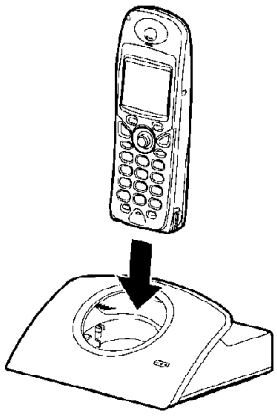
Please ensure the batteries are inserted as shown. ⊖ part should be inserted first.
Close the cover as indicated by the arrow.

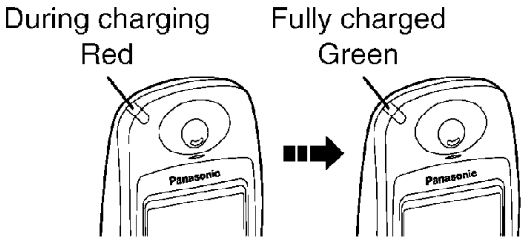
- When you replace the batteries, ⊕ part should be removed first.



4.2. Battery Charge

At the time of shipment, the batteries are not charged. To charge, place the handset on the base unit.
Please charge the batteries for about 7 hours before initial use. During charging, the charge LED will light as shown below.





Display icon	Battery strength
	High
	Medium
	Low
	Needs to be charged

The handset which power is off will be turned on automatically when it is placed on the base unit.
The handset will not operate while it is on the base unit.
If you do not recharge the handset battery for more than 15 minutes, the display will flash

when the handset is lifted off the base unit.

Note for Service:

- The battery strength may not be indicated correctly if the battery is disconnected and connected again, even after it is fully charged. In that case, by recharging the battery as mentioned above, you will get a correct indication of the battery strength.

- Confirmation of Antenna Pict ( ) indication:
If Antenna Pict is indicated, charge time is about 7 hours. However, if Antenna Pict is flashing, charge time becomes long.

4.3. Battery Information

After your Panasonic battery is fully charged:

Ni-MH Batteries (typical 700 mAh)

Operation	Operating Time
While in use (TALK)	10 hrs approx.
While not in use (Standby)	120 hrs approx.

Ni-Cd Batteries (typical 250 mAh)

Operation	Operating Time
While in use (TALK)	4 hrs approx.
While not in use (Standby)	40 hrs approx.

- Times indicated are for peak performance.

- The battery operating time may be shortened depending on usage conditions and ambient temperature.

- Clean the charge contacts of the handset and the base unit with a soft, dry cloth. Clean if the unit is subject to grease, dust or high humidity.
Otherwise the battery may not charge properly.

- The batteries cannot be overcharged unless they are repeatedly removed and replaced. For maximum battery life, it is recommended that the handset not be recharged until the battery

icon flashes .

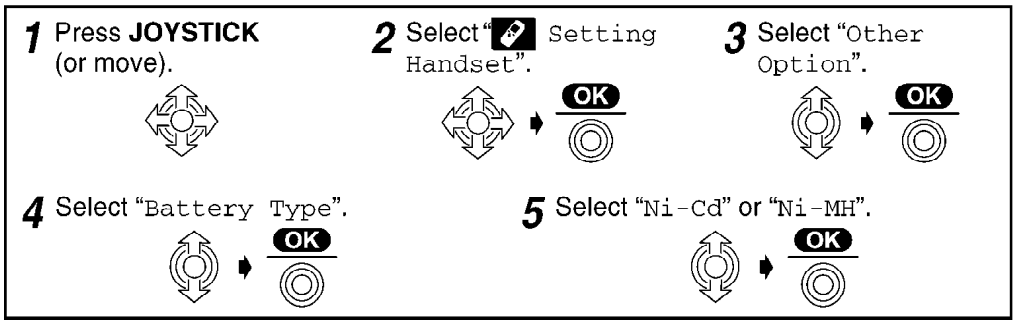
4.4. Replacing the Batteries

If the **icon flashes after a few telephone calls even when the handset batteries have been fully charged, both batteries must be replaced.**

- Charge new batteries for approximately 7 hours before initial use. (The telephone line cord must not be connected to the telephone socket at this time).
When replacing the batteries, ensure that the correct battery type is selected.

- When replacing the batteries, be sure to set up the battery type even if you install the same type of batteries to initialise battery remaining memory of your handset.

Setting the Battery Type

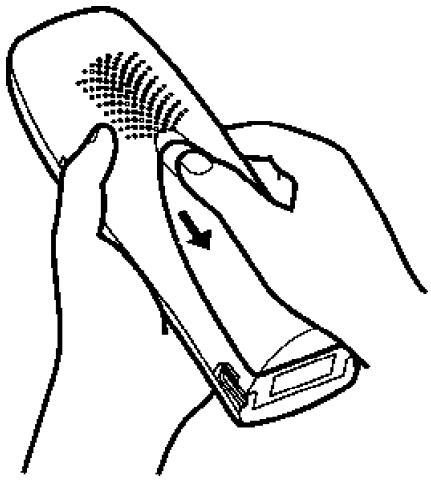


- The factory proset is "Ni-MH".

- To exit the operation, press **at any time.**

- Do not use non-rechargeable batteries. If non-rechargeable batteries are fitted and start charging, it may cause the leakage of the battery electrolyte.

- Press the notch on the cover firmly and slide it as indicated by the arrow. Replace both batteries and close the cover then charge the handset for about 7 hours.

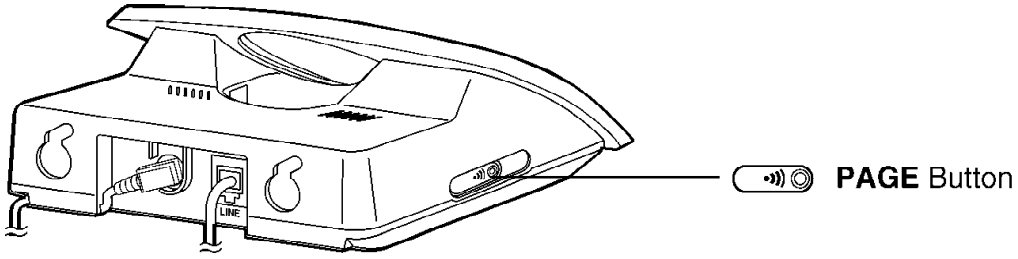


Please order Panasonic HHR-4EPT(Ni-MH) or P-4NPT(Ni-Cd) batteries.
Note for Service:

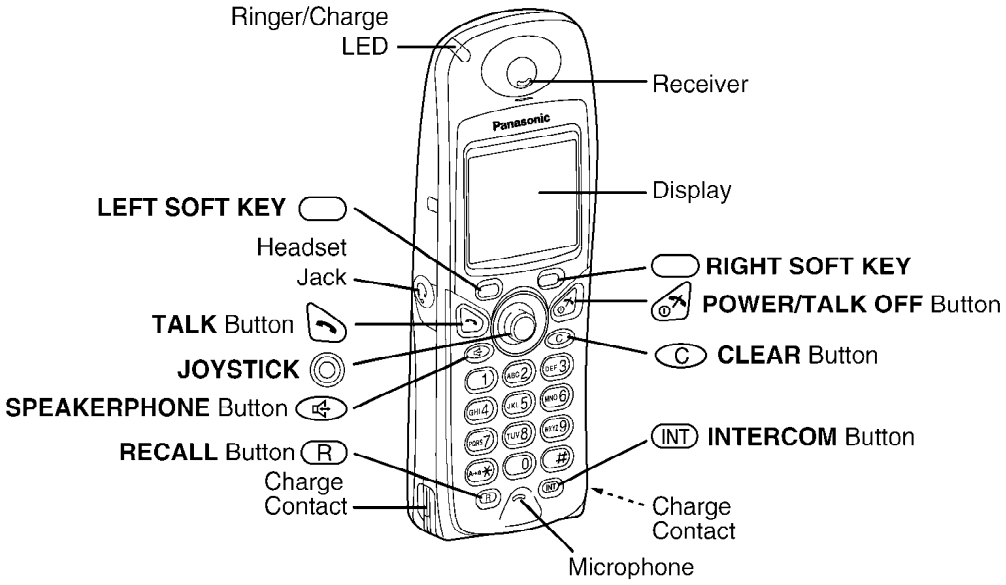
- When Ni-Cd batteies are littled with the "BATTERY TYPE" setting in "Ni-MH", icon might disappear and stop charging even if the handset is on the cradle for avoiding overcharge.

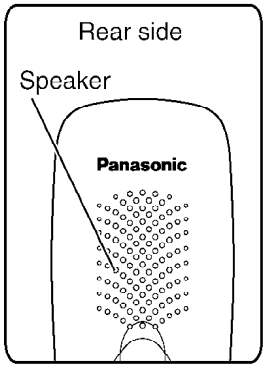
5. LOCATION OF CONTROLS

5.1. Base Unit



5.2. Handset

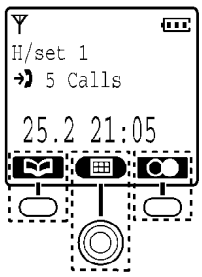




How to Use the Handset Soft Keys

3 soft keys are used to select functions displayed directly above the keys.
Functions displayed above the keys will change depending on the state of use.
For example, on the standby mode display, "[Phonebook]", "[Menu]", "[Redial]" are displayed above the soft keys.

Example: Standby Mode Display



To operate "[Phonebook]" (**Phonebook**), press **LEFT SOFT KEY.**

To operate "[Menu]" (**Menu**), press **JOYSTICK** directly as the middle soft key.

To operate "[Redial]" (**Redial**), press **RIGHT SOFT KEY.**

When "[ ]" is displayed above a soft key, the soft key will not work.

To select only "[Menu]" (**Menu**), you can also select it moving **JOYSTICK** up, down, left or right.

Meanings of Icons above SOFT KEYS

Icons	Functions	Icons	Functions
	Go Back		Alphabet
	Menu		Numeric
	Sub-Menu		Extended 1
	OK		Extended 2
	Redial		Greek
	Phonebook		Russian
	New Phonebook		Select
	Search		Pause
	Key Lock		Mute
	12/24 Hour Clock		Delete
	Stop		No Function

6. SETTINGS

Enviroment

Do not use this unit near water. This unit should be kept away from heat sources such as radiators, cookers, etc. It should also not be placed in rooms where the temperature is less than 5°C or greater than 40°C.

The AC adaptor is used as the main disconnect device. Ensure that the AC outlet is located/ installed near the unit and is accessible.

Location

- For maximum distance and noise-free operation, place your base unit:

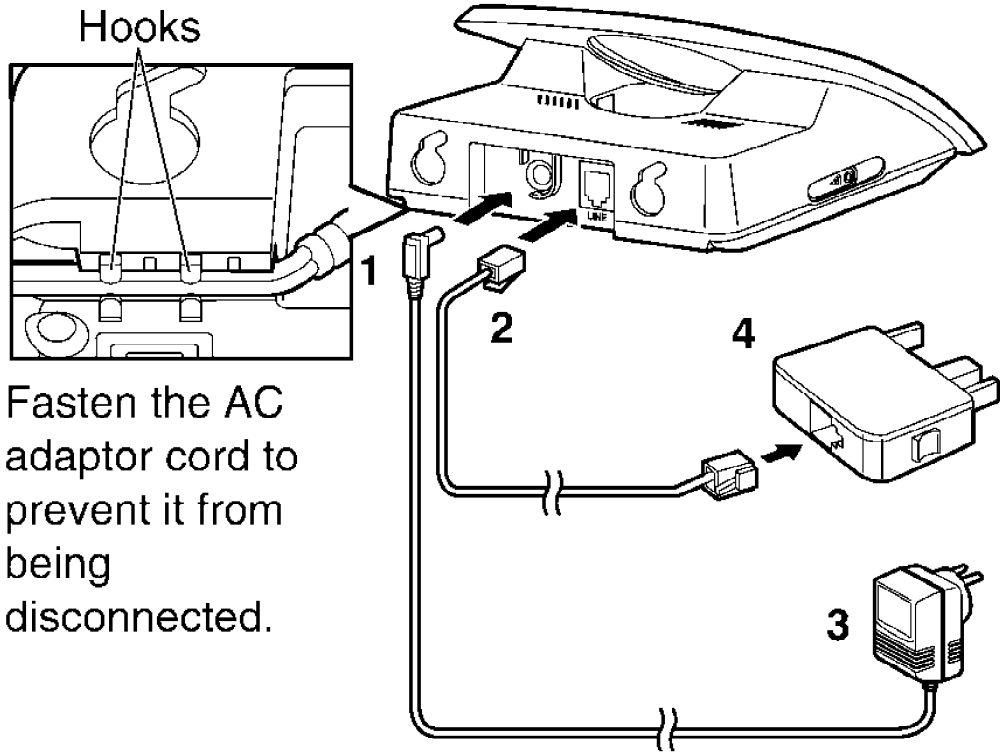
- Away from electrical appliances such as TVs, radios, personal computers or other phones.

- In a convenient, high, and central location.

6.1. Connection

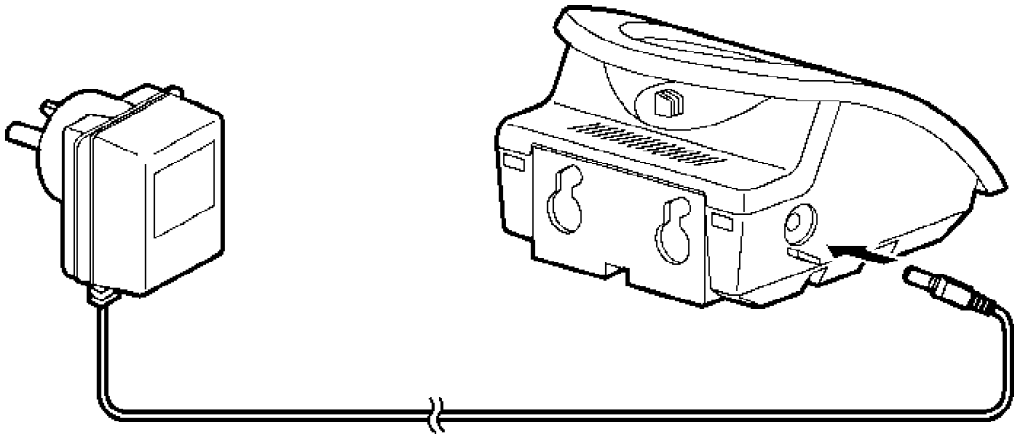
6.1.1. Base Unit

Plug in the AC adaptor and the telephone line cord in order 1, 2, 3, 4.



- The AC adaptor must remain connected at all times (It is normal for the adaptor to feel warm during use).
- Never install telephone wiring during a lightning storm.
- USE ONLY WITH Panasonic AC ADAPTOR PQLV19ALZ.
- KX-TCD510AL is not designed to be used with rotary (pulse dialling) services.
- The unit will not work during a power failure. We recommend you connect a standard telephone on the same line for power protection.

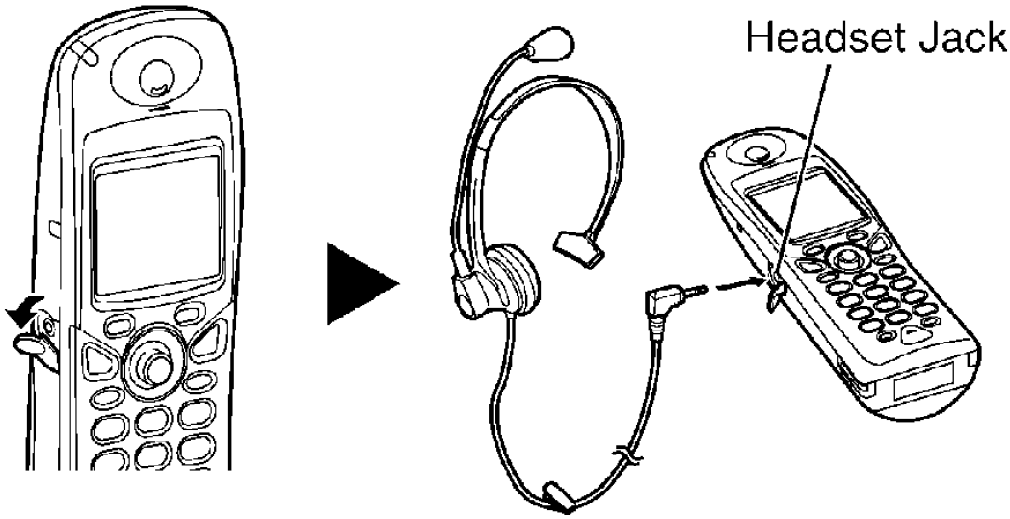
6.1.2. Charger Unit



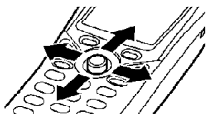
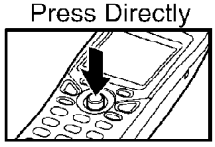
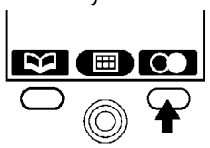
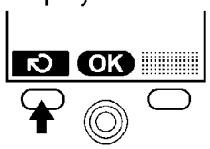
The AC adaptor must remain connected at all times (It is normal for the adaptor to feel warm during use).

6.1.3. Optional Headset

Plugging an optional headset into the handset allows hands-free phone conversations. Please use only the Panasonic KX-TCA89AL headset. While using the headset, speakerphone is not available. To switch to speakerphone, disconnect the headset.
Connecting the optional headset to the handset
Open the headset jack cover, and connect the optional headset to the headset jack as shown.



6.2. Symbols Used in This Service Manual

Symbol	Meaning	
	Move **JOYSTICK** up, down, left or right. e.g., Search the main menu. 	
e.g., OK	e.g., Display of menu items	Press **JOYSTICK** directly in the centre. In this example, the desired item is selected. 
e.g., Redial	e.g., Standby Mode Display 	Press **RIGHT SOFT KEY.** In this example, the telephone number last dialled is displayed.
e.g., Go Back	e.g., Display of menu items 	Press **LEFT SOFT KEY**. In this example, the display returns to the previous menu. C has the same function.
	Press **POWER/TALK OFF** Button. **Press this button for one or two times, then the display returns to the standby mode any time.**	
	To go to the next step.	
“ ”	The words in “ ” indicate the words in the display.	
	Ringing Phone	

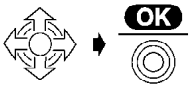
6.3. Setting the Ringer Volume

6.3.1. Base Unit

To exit the operation, press at any time.

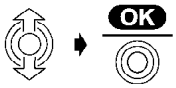
1 Press **JOYSTICK** (or move).

2 Select "Setting Base".



3 Enter 4-digit Base Unit PIN. (Factory Preset 0000)

4 Select "Ringer Option".



5 Select "Ringer Volume".

6 To increase volume, move the **JOYSTICK** up. To decrease volume or set to OFF, move the **JOYSTICK** down. (3 levels)

7 Press **JOYSTICK**.

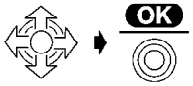
- The factory preset is medium.

6.3.2. Handset

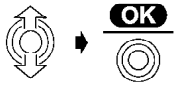
The choices are 6 levels and off. If you set the volume to OFF, "" is displayed, however, still the volume of a paging and intercom call are level 1.

1 Press **JOYSTICK** (or move).

2 Select " Ringer Option".



3 Select "Ringer Volume".



4 To increase volume, move the **JOYSTICK** up. To decrease volume, move the **JOYSTICK** down.

5 Press **JOYSTICK**.

- The factory preset is 6.

6.4. Settings Menu Chart

6.4.1. Base Unit

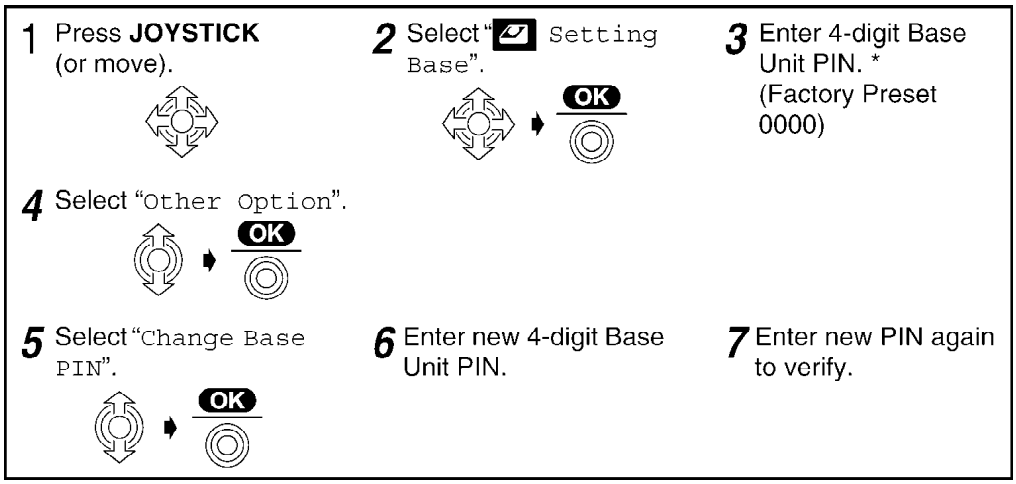
1st Menu	2nd Menu	3rd Menu
Setting Base	Ringer Option	Ringer Volume
	Call Option	Recall
		Pause Time
		Emergency Call
		Set ARS
		Call Restricted
	Cancel Handset	
	Other Option	Change Base PIN
		Reset Base

6.4.2. Handset

1st Menu	2nd Menu	3rd Menu
Setting Handset	Set Date/Time	
	Memo Alarm	
	Ringer Option	Ringer Volume
		EXT Ringer Type
		INT Ringer Type
		Paging Tone
		Private Ring
	Tone Option	Key Tone
	Display Option	Standby Display
		Talk Display
		Select Language
		Private Colour
		Category Name
	Call Option	Call Bar
		Direct Call No.
		Direct On/Off
	Registration	Register H/set
		Cancel Base
	Select Base	Auto
		Base 1 ⋮ Base 4
	Other Option	Change H/S PIN
		Change H/S Name
		Auto Talk
		Battery Type
		Reset Handset

6.5. PIN Code

6.5.1. Base Unit


1 Press JOYSTICK (or move).
2 Select "Setting Base".
OK
3 Enter 4-digit Base Unit PIN. * (Factory Preset 0000)
4 Select "Other Option".
OK
5 Select "Change Base PIN".
OK
6 Enter new 4-digit Base Unit PIN.
7 Enter new PIN again to verify.

- To exit the operation, press at any time.

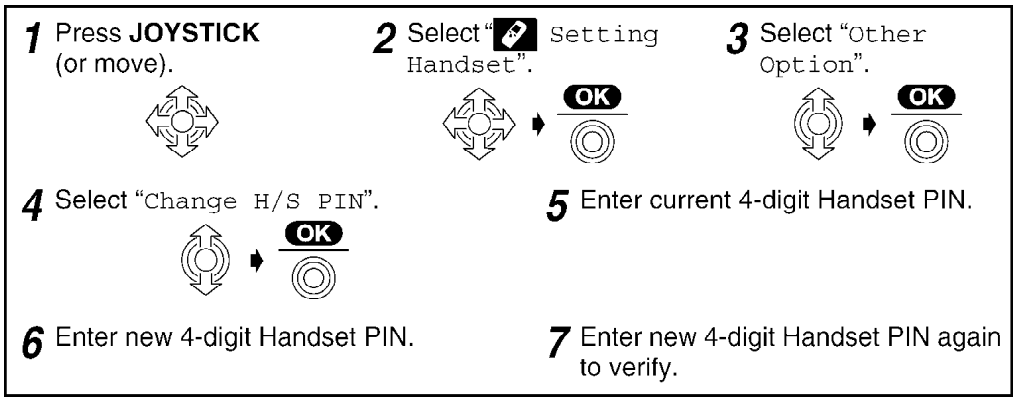
For Service Hint:

*** : If the current 4-digit Base Unit PIN is forgotten, follow the procedures below.**

1. If Base Unit and Handset are not linked with, first, follow the steps in Handset Registration to a Base Unit ().

2. Follow the steps above in Base Unit () of PIN Code. At step 3, enter * 7 0 0 0, and you will able to enter new Base Unit PIN.

6.5.2. Handset


1 Press JOYSTICK (or move).
2 Select "Setting Handset".
OK
3 Select "Other Option".
OK
4 Select "Change H/S PIN".
OK
5 Enter current 4-digit Handset PIN.
6 Enter new 4-digit Handset PIN.
7 Enter new 4-digit Handset PIN again to verify.

- To exit the operation, press at any time.

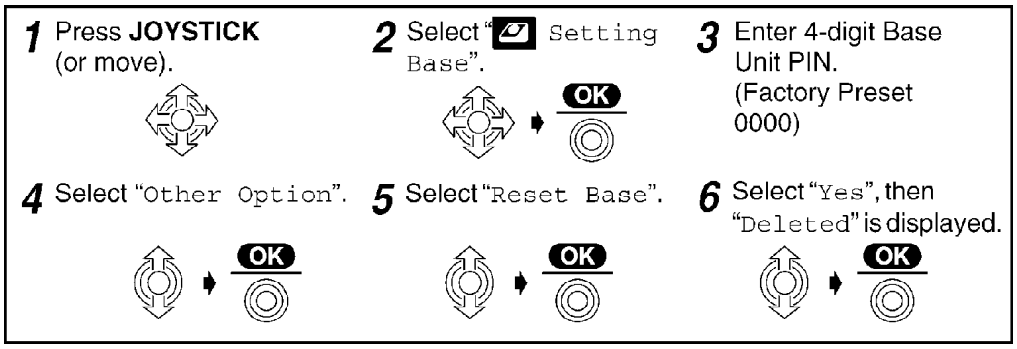
For Service Hint:

*** : If the current 4-digit PIN is forgotten, press * 7 0 0 0 and you will be able to enter new Handset PIN.**
This password is useful whether Base Unit and Handset are linked with or not.

6.6. Reset

6.6.1. Base Unit

You can reset all of the base unit settings to their initial settings.



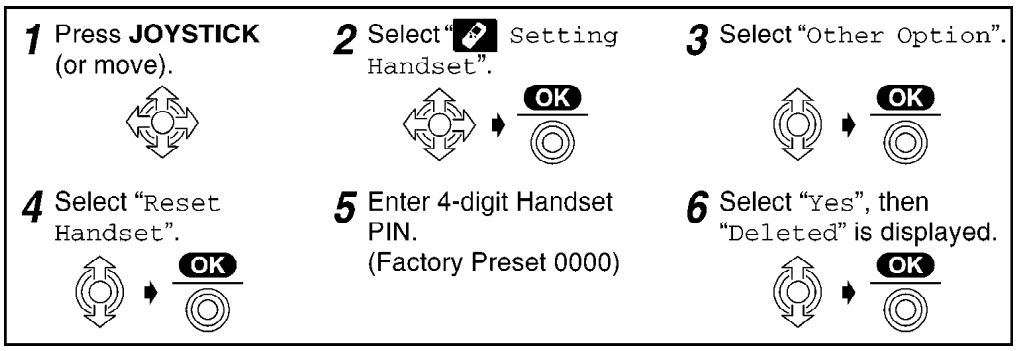
- To exit the operation, press any time.

Base Unit Initial Settings

Function	Initial Setting	Remarks (selectable
Recall Time	Type 2 (100ms)	Type 1 (700 ms) / Type ms) / Type 3 (200 ms)
Pause Time	Short (3 seconds)	3 seconds / 5 seconds
Emergency Call Number 1	000	-
Call Restricted Handset(s)	Delete All	-
Call Restriction Number(s)	Delete All	-
4-Digit Base Unit PIN	0000	-
Base Unit Ringer Volume	Medium	High / Medium / Low /
Caller ID List	Delete All	-
Date/Time	31-12-03/00:00	-
Answering System	ON	ON / OFF
Your Own Greeting Message	Remain	-
Caller's Recording Time	No Limit	Greeting Only / 1 min /
Number of Rings	4 Rings	2 ~ 9 Rings
Greeting Monitor	ON	ON / OFF
Remote Code	Delete (OFF)	000 ~ 009 / OFF (
Incoming/Memo Message(s)	Remain	-
Area Code	Delete All	-

6.6.2. Handset

You can reset all of the handset settings to their initial settings.



- To exit the operation, press at any time.

Handset Initial Settings

Function	Initial Setting	Remarks (selectable
Memo Alarm Mode	OFF	OFF / Once / Daily
Alarm Time	Delete	-
Handset Ringer Volume	6	1 to 6
Handset External Ringer Pattern	1	1 to 15
Handset Internal Ringer Pattern	1	1 to 15
Handset Paging Tone Pattern	1	1 to 15
Handset Private Ringer Pattern	1	1 to 15
Handset Alarm Tone Pattern	1	1 to 15
Key Tone	ON	ON / OFF
Standby Mode Display	Handset Name	Base Number / Handset OFF
Talk Mode Display	Talk Time	Talk Time / Charge / Phc Number
Display Language	English	19 languages
Call Bar Mode	OFF	ON / OFF
Direct Call Mode	OFF	ON / OFF
Direct Call Number	Delete	-
4-Digit Handset PIN	0000	-
Auto Talk	OFF	ON / OFF
Select Base	Automatic Base Unit Selection	Auto / Base 1
Redial Memory	Delete All	-
Handset Receiver Volume	Medium	Low / Medium / High
Walkie-Talkie Setting	Group	Common / Group
Phonebook List	Remain	-
LED Colour of Private Category	Green	Green / Orange / Red
Bettery Type	Ni-MH	Ni-MH / Ni-Cd

6.7. Key Lock

You can lock the handset dialling buttons. Only incoming calls are accepted while the key lock is ON. When the key lock is ON, the menu icon changes to .
When the key lock is ON, emergency calls cannot be made until key lock is cancelled.

<Key Lock ON>

(Standby Mode Display) → Press and hold **JOYSTICK** directly for more than 2 seconds.

<Key Lock OFF>

Press and hold **JOYSTICK** directly for more than 2 seconds once more.

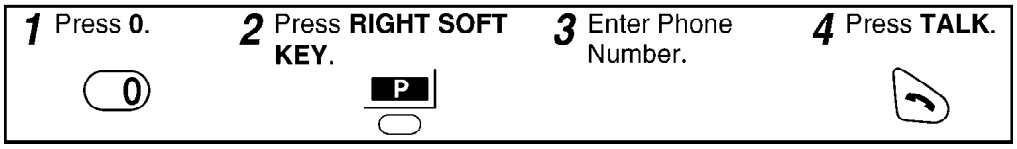
Note for Service:
The key lock is cancelled if the handset is turned off.

6.8. Recall Feature

RECALL (R) is used to access special telephone services. Contact your telephone company for details. If your unit is connected to a PBX, pressing (R) allows you to access some features of your host PBX such as transferring an extension call.

6.9. Dialling Pause for PBX line/long distance service users

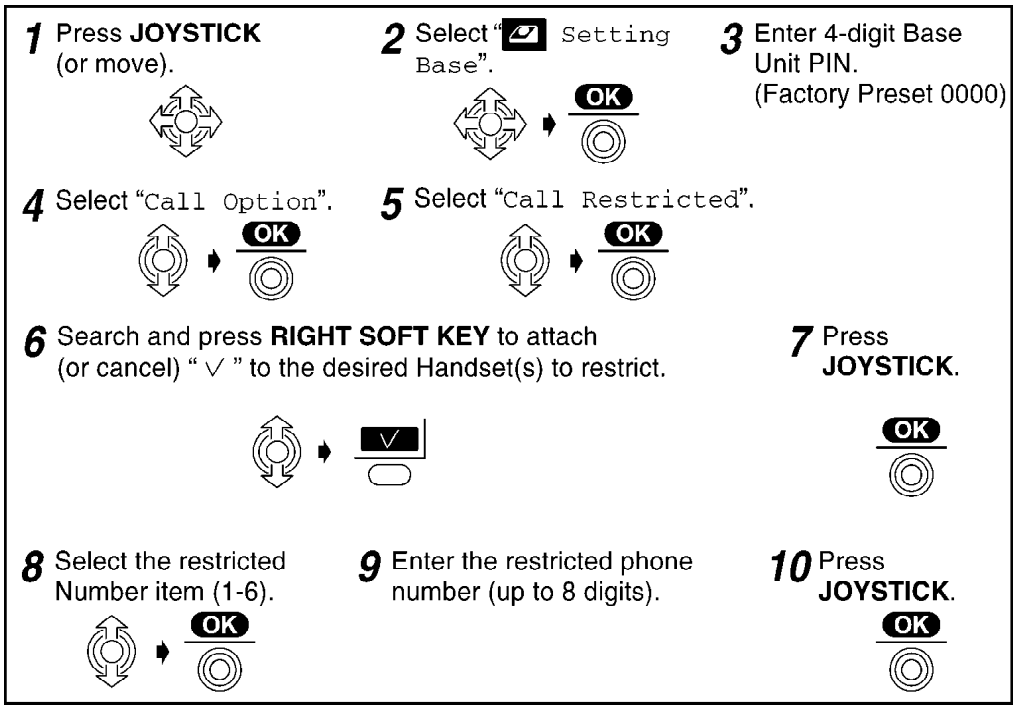
A dialling pause is used when a pause in the dialling of a phone number is necessary using a PBX or accessing a long distance service.
For example, when 0 (line access number) is dialled followed by a pause to access an outside line through a PBX:



- **Entering a pause prevents misdialling when you redial or dial a stored number.**
- **Pressing RIGHT SOFT KEY more than once increases the length of the pause between numbers.**

6.10. Call Restriction

You can restrict selected handset(s) from dialling selected phone numbers. You can assign up to 6 call restriction numbers (up to 8 digits). If you dial a restricted number, the call does not connect and the restricted number flashes.

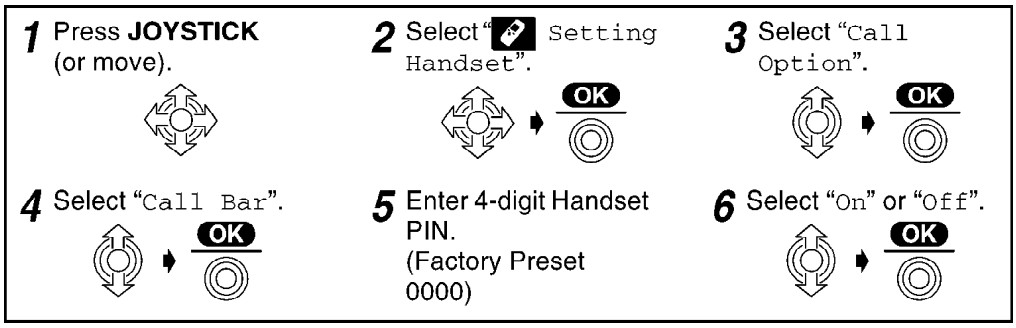

1 Press JOYSTICK (or move).
2 Select "Setting Base".
OK
3 Enter 4-digit Base Unit PIN. (Factory Preset 0000)
4 Select "Call Option".
OK
5 Select "Call Restricted".
OK
6 Search and press RIGHT SOFT KEY to attach (or cancel) " ✓ " to the desired Handset(s) to restrict.
7 Press JOYSTICK.
OK
8 Select the restricted Number item (1-6).
OK
9 Enter the restricted phone number (up to 8 digits).
10 Press JOYSTICK.
OK

- To exit the operation, press **at any time.**

Note:
When you put a first digit on step 9, it must overwrite the current displayed numbers. We recommend you to write down the restricted phone number you entered.

6.11. Call BAR On/Off (Call Prohibition On/Off)

When this feature is set to ON, outgoing calls cannot be made. Intercom calls and calls to numbers assigned as emergency numbers can be made.

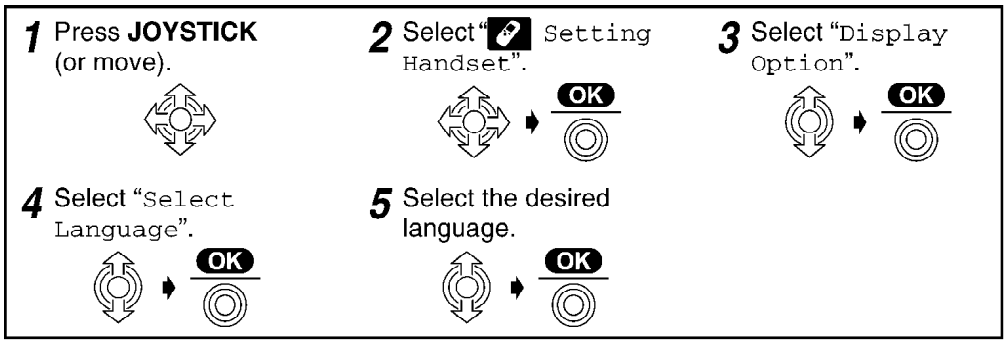


- To exit the operation, press **at any time.**

- While the Call Bar mode is turned on, " " is displayed.

6.12. Selecting the Display Language

You can select one of 19 languages. The factory preset is English.



- If you set a language you cannot read, reset the handset to its initial settings.

  Press ➧ Press ➧ Move ➧ Press ➧ Move ➧ Press ➧ Move ➧ Press ➧ Enter 4-digit Handset PIN (Factory Preset 0000) ➧ Move ➧ Press

  All handset settings will be reset to their initial settings, however, the phonebook data will be saved.

Note for Service:

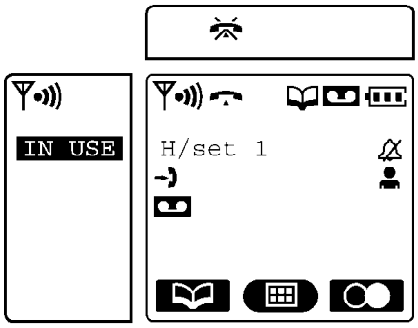
(for optional handset)

- Press ➧ Press ➧ Move ➧ Press ➧ Move four times ➧ Press ➧ Move twice ➧ Press ➧ Select desired language by moving ➧ Press .

- To exit the operation, press at any time.

7. DISPLAY

7.1. Display Icons



Within range of a base unit

Out of range/No registration/
No power on base unit

Paging/Intercom/
While connecting with base unit

Making or answering calls

Call Bar ON

Phonebook Mode

Answering System ON
Message indication

Battery strength

Direct Call ON

Ringer Volume OFF

H/set 1 Handset Name (e.g., Handset 1)

New call (Caller ID only)

IN USE The line is being used by another handset (for additional handset users).

7.2. Main Menu Display

To go to the **Main Menu**, press **JOYSTICK** directly in the centre (or move) while in the standby mode display. The selected menu icon is turned over, and its title is displayed.

Example: "Caller ID" is selected.

Caller ID

TAM Operation

Handset Ringer Option

Setting Handset

Setting Base Unit

Walkie-Talkie

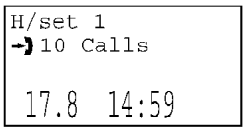
For Service Hint:

icon will be displayed if the unit took a signal from Telephone Company as a Voice Message signal.
In that case, press the right button of the Navigator key for a while.

7.3. Caller ID Service

Caller ID is a service of your Telephone company and will only operate if you have subscribed to this service.
After subscribing to Caller ID, this phone will display the caller information.
If your unit is connected to a PBX or a telephone line that does not support this service, you will not be able to use it.

Standby Mode Display



When new calls have been received, the display shows the number of calls.
In the example on the left, 10 new calls have been received.

7.4. Before Requesting Help (Troubleshooting)

If you experience any problems with the normal use of your apparatus, you should unplug it from the telephone outlet and connect a known working telephone in its place. If the known working telephone still has problems, then please contact the customer service department of your telephone company. If it operates correctly, then the problem is likely to be a fault in your apparatus. In this case, contact your supplier for advice. Your telephone company may charge you if they attend a service call that is not due to apparatus supplied by them. Turn the power OFF then ON (Handset)/Disconnect then connect the AC adaptor (Base Unit).

Problem	Possible cause	Solution
The unit does not work.	• Batteries not installed properly. • AC adaptor of base unit not connected properly.	• Re-install batteries properly. • Disconnect and then connect AC adaptor.
Display is blank.	• Handset not turned on.	• Turn on power. (Refer to **Power ON/OFF**.)
Display is blank even if the unit is charged.	• Battery low.	• Recharge batteries more than about 15 minutes.
Handset will not turn on.	• Batteries not inserted. • Batteries not charged.	• Insert the 2 rechargeable batteries supplied. • Place handset on base and connect AC adaptor to base and AC outlet (full charge period 7 hrs).
Battery charge icon not counting up.	• Dirty charge contact. • Base not powered up.	• Clean charge/battery contact and retry charge. • Connect AC adaptor to base unit and AC outlet.
icon flashes.	• Handset not registered to base. • Handset out of range of base. • No power into base unit.	• Register handset to base.*1 • Move handset closer to base. • Connect AC adaptor to base unit and AC outlet.
Handset busy tone heard when is pressed.	• Handset out of range of base. • Another handset in use.	• Register handset to base.*2 • Move handset closer to base. • Wait for the other user to complete call.
No dial tone.	• Telephone line not connected.	• Insert telephone line cord to network. • Turn power OFF then ON. (Refer to **Power ON/OFF**.)
Cannot dial out.	• Call Bar mode ON. • Particular dialled number is restricted. • Key lock mode ON.	• Turn feature off. (Refer to **Call BAR ON/OFF**.) • Remove number from call restricted list. (Refer to **Call Restriction**) • Turn key lock OFF. (Refer to **Key Lock**.)
Handset will not ring.	• Ringer switched off.	• Set ringer to one of 6 volume levels.
Last number redial does not work.	• Number exceeded 24 digits.	• Redial manually.
No Caller ID number displayed.	• Service not supplied. • Caller has withheld info.	• Caller ID service must be arranged with your telephone company.
icon flashes.	• Battery low.	• Recharge batteries.
Cannot register handset to base.	• Max. number of bases already registered to handset. • Max. number of handsets already registered to base unit. • Wrong PIN number entered (Default 0000). • Electrical noise in local area.	• Delete unused base registrations from handset. • Delete unused handset registrations from base. • If PIN number is lost, contact the Panasonic Service Centre. (Refer to **PIN Code**.) • Move base/handset away from sources of electrical noise (e.g., TVs, radios, etc.).

Answering System

Problem	Possible cause	Solution
The answering system is on, but incoming messages are not recorded.	• The recording time is set to "Greeting Only". • Memory is full (30 minutes or 64 messages).	• Select "1 Minute" or "No Limit". • Erase some or all of the messages.
Cannot operate the answering system from a touch tone phone.	• Incorrect remote code entered. • Tone are too short to activate the unit. • The answering system is off.	• Enter the correct remote code. • Press each button firmly. • Turn on the answering system.
Cannot operate the answering system with the handset.	• Someone is operating the answering system. • You are too far from the base unit.	• Retry when other user has finished operation. • Move closer to the base unit.
While recording a greeting message, the unit starts to ring and stops recording.	• A call is being received.	• To answer the call, press **TALK**. The recording stops halfway. Start from the beginning after hanging up.
During playback, the unit starts to ring and stops playback.	• A call is being received.	• To answer the call, press **TALK**.

Cross Reference:
Power ON/OFF ()
Call BAR On/Off (Call Prohibition On/Off) ()
Call Restriction ()
Key Lock ()
PIN Code ()

Note:
***1, *2: It will take time for both Base Unit and Handset to be linked with.**

8. OPERATIONS

8.1. Power ON/OFF

Power ON

Press and hold **POWER**. ➧ When **POWER** is released, the display changes to the standby mode.

Power OFF

Press and hold **POWER**. ➧ The display goes blank.

8.2. Setting the Date and Time

After a mains power failure, the clock needs to be adjusted. Ensure that the icon is not flashing.
To exit the operation, press at any time.

1 Press **JOYSTICK** (or move).
2 Select "Setting Handset". ➧ OK
3 Select "Set Date/ Time". ➧ OK
4 Enter the date (see below).
5 Enter the time (see below).
6 Press **JOYSTICK**. OK

Example: To set 16 February, 2003, 7:15 pm.

Date			Time		
Day	Month	Year	Hour	Minute	12/24 hour clock
1 6	0 2	0 3	0 7	1 5	12/24 12/24

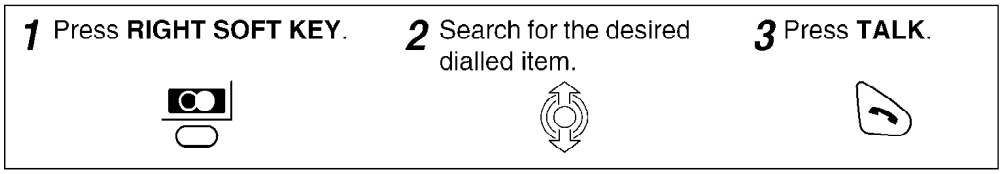
To select 12/24 hour clock

Press **RIGHT SOFT KEY** repeatedly. 12/24
24 hour clock ➧ 12 hour clock (AM) ➧ 12 hour clock (PM)

8.3. Redialling

The last 10 numbers dialled are automatically stored in the redial list.

Dialling with the Redial List



- If there are no items stored in the redial list when pressing , the display shows "Memory Empty".
- If the items are scrolled at the end when you search for the desired dialled item, an end tone sounds.
- You can also press to make a call.

Dialling the Last Number Dialled

Auto Redial

If you press then to redial and the dialled number is engaged, the unit will automatically call back every 40 seconds, up to 10 times. When using Auto Redial, press again after pressing if the mute has not been cancelled.

8.4. Phonebook

You can store up to 200 caller information in the handset phonebook and up to 20 caller information in the base unit phonebook. If you subscribed to Caller ID and you received a call from the same phone number you stored with name in the phonebook, the display will show the caller's name.

Private Category Feature

You can categorise caller information in the phonebook. There are 9 categories available. For example, category 1 can be used to save all friends' numbers. For each category, you can rewrite the category names (max. 10 digits), you can select one of 3 Ringer LED colours and one of 15 ringer types. This feature is only available after subscribing to Caller ID Service. Please contact your telephone company for further information.

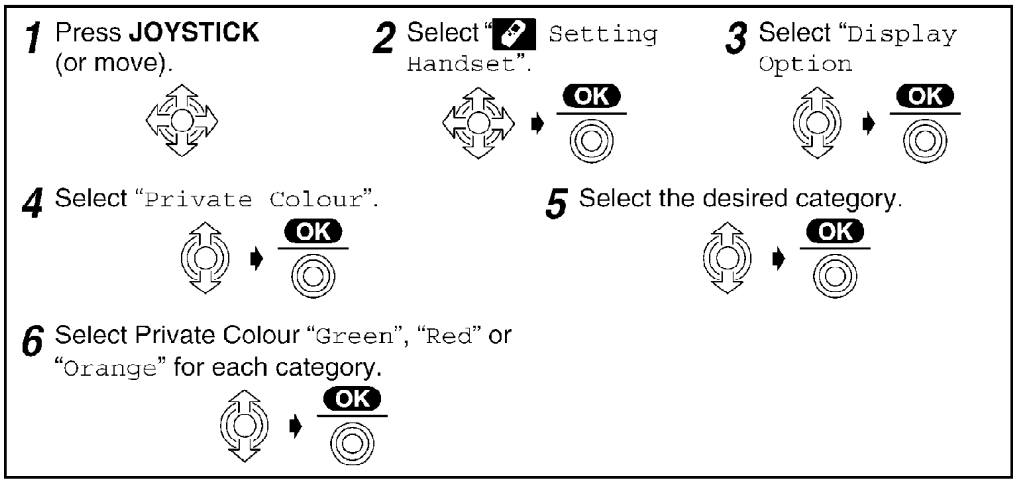
Example

Private Category No.	Ringer LED Colour*			Private Ringer Type	Category Name
	Green	Orange	Red		
1		✓		3	Friends
3			✓	2	Customers

* The factory preset LED colour is green.

- The unit will indicate an incoming call using the factory preset LED colour (green) and the ringer pattern assigned to external calls momentarily until Caller ID information is received from the service provider.

Setting the Private Colour



- The factory preset is "Green".
- When you select the private colour on step **6**, the Ringer LED will flash at the selected colour.

Audible Caller ID

To use this feature, you need to subscribe to Caller ID service. For further information, please contact your telephone company. You need to store caller information and to record the name into the base unit phonebook.

When a call comes in, the unit will ring and the caller information will be received.

If you receive a call from one of the same phone numbers stored in the base unit phonebook, the handset will announce the recorded name.

- If the ringer volume of the handset is OFF, recorded name will not be announced. Announcement volume depends on the handset ringer setting.

- Your unit may mute one or more of rings in order to announce the name of the caller, as announcement is prior to rings.

8.4.1. Storing Caller Information

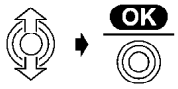
- To exit the operation, press **any time.**

Handset Phonebook

1 Press **LEFT SOFT KEY**.

2 Press **JOYSTICK**.

3 Select "H/set Phonebook", then the display shows the number of empty phonebook entries.



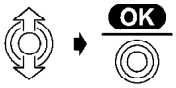
4 Enter Name. (max. 16 charaters)

5 Press **JOYSTICK**.

6 Enter Phone Number. (max. 24 digits)

7 Press **JOYSTICK**.

8 Select the desired category or "Off".



9 Select "Save", then "Saved" is displayed.

- If "Memory Full" is displayed at step **3**, the phonebook is full. To store, delete other stored items in the phonebook.
- To continue storing other caller information, repeat from step 4.

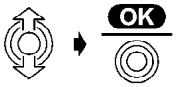
Base Unit Phonebook

To use an Audible Caller ID feature, you must store caller information into the base unit phonebook.

1 Press **LEFT SOFT KEY**.

2 Press **JOYSTICK**.

3 Select "Base Phonebook", then the display shows the number of empty phonebook entries.



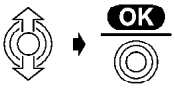
4 Enter Name. (max. 16 characters)

5 Press **JOYSTICK**.

6 Enter Phone Number. (max. 24 digits)

7 Press **JOYSTICK**.

8 Select "Start Recording".



9 Record the name within 1 minute.

10 Press **JOYSTICK**.

11 Select "Save", then "Saved" is displayed.

- If "Memory Full" is displayed at step **3**, the phonebook is full. To store, delete other stored items in the phonebook.
- If "Memory Full" is displayed at step **8**, the remaining recording time is 0. To store, delete unnecessary incoming/memo messages.
- To continue storing other caller information, repeat from step **4**.

Copying an Item from Handset Phonebook to Base Unit Phonebook

Press INTERCOM (INT) ➧ Press ➧ Press to select "Copy to Base" ➧

Move to select the desired item ➧ Press ("Copy Complete" is displayed.)

8.4.2. Entering Names/Characters

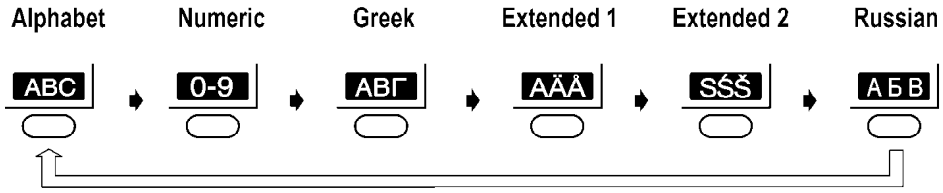
Keys	Operations
	Move the **JOYSTICK** up, down, left or right to move the cursor (a flashing digit).
0 to WXYZ 9	Press to enter letters/numbers. (Items are added to the left of the cursor. If the cursor is at the beginning of a line, the item is added at the beginning.)
C	Press to delete characters. (Character on the cursor is deleted. To delete all characters, press and hold.)
A→a *	Press to change between upper and lower case.
0	Press to insert a blank space (except when in Numeric input mode).
1	Press to insert a symbol (*, #, /, etc.) (except when in Numeric input mode).

Selecting the Input Mode

You can select one of 6 input modes by pressing **RIGHT SOFT KEY** while entering a name. The function icon above the key displays the current input mode. The factory preset is "**Alphabet Mode**".

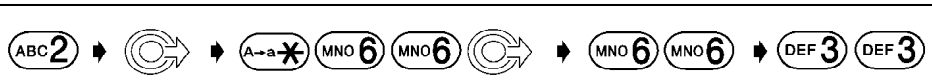
For the full character map, see **Phonebook Character Table**.

To switch the input mode while editing the name in the phonebook, press **RIGHT SOFT KEY.**



Example (Alphabet Mode)

Enter the name using the letters on the keypad. For example, to enter "Anne" in Alphabet Mode:



Cross Reference:

Phonebook Character Table ()

8.4.3. Phonebook Character Table

Buttons	Alphabet (ABC)	Numeric (0–9)	Greek(ΑΒΓ)	Extended 1(AÄÅ)	Extended 2 (SŚŠ)	Russian (АБВ)
1	Space # & ' ( ) *, – . / 1	1	Space # & ' ( ) *, – . / 1			
ABC 2	A B C 2	2	Α Β Γ 2	A À Á Â Ã Ä Å Æ B C Ç 2	A Á Ä Ą B C Ć Č 2	А Б В Г 2
	a b c 2			a à á â ã ä å æ b c ç 2	a á ä Ą b c Ć Č 2	
DEF 3	D E F 3	3	Δ E Z 3	D E È É Ê Ë Ē F 3	D Ď E É Ę Ě F 3	Д Е Ж З 3
	d e f 3			d e è é ê ë ē f 3	d ď e é Ę ě f 3	
GHI 4	G H I 4	4	Η Θ Ι 4	G Ğ H I Ì Í Î Ï Ī İ Ĭ 4	G H I Í 4	И Й К Л 4
	g h i 4			g ğ h i ì í î ï ī ı ĭ 4	g h i í 4	
JKL 5	J K L 5	5	Κ Λ Μ 5	J K L 5	J K L Ł Ĺ Ľ 5	М Н О П 5
	j k l 5			j k l 5	j k l Ł Ĺ Ľ 5	
MNO 6	M N O 6	6	Ν Ξ Ο 6	M N Ñ O Ò Ó Ô Õ Ö ø 6	M N Ń Ň O Ó Ö Ő 6	Р С Т У 6
	m n o 6			m n ñ o ò ó ô õ ö ø 6	m n Ń ň o ó ö ő 6	
PQRS 7	P Q R S 7	7	Π Ρ Σ 7	P Q R S Ş ß 7	P Q R Ŕ Ř S Ś Š 7	Ф Х Ц Ч 7
	p q r s 7			p q r s Ş ß 7	p q r Ŕ ř s Ś Š 7	
TUV 8	T U V 8	8	Τ Υ Φ 8	T U Ù Ú Û Ü Ũ V 8	T Ť U Ú Ü Ű ů V 8	Ш Щ Ъ Ы 8
	t u v 8			t u ù ú û ü ū v 8	t ť u ú ü ű ů v 8	
WXYZ 9	W X Y Z 9	9	Χ Ψ Ω ϑ 9	W Ŵ X Y ŷ Z 9	W X Y ỳ Ý Z Ź Ž Ż 9	Ь Э Ю Я 9
	w x y z 9			w Ŵ x y ŷ z 9	w x y ỳ ý z Ź Ž Ż 9	
0	Space 0	0	Space 0			

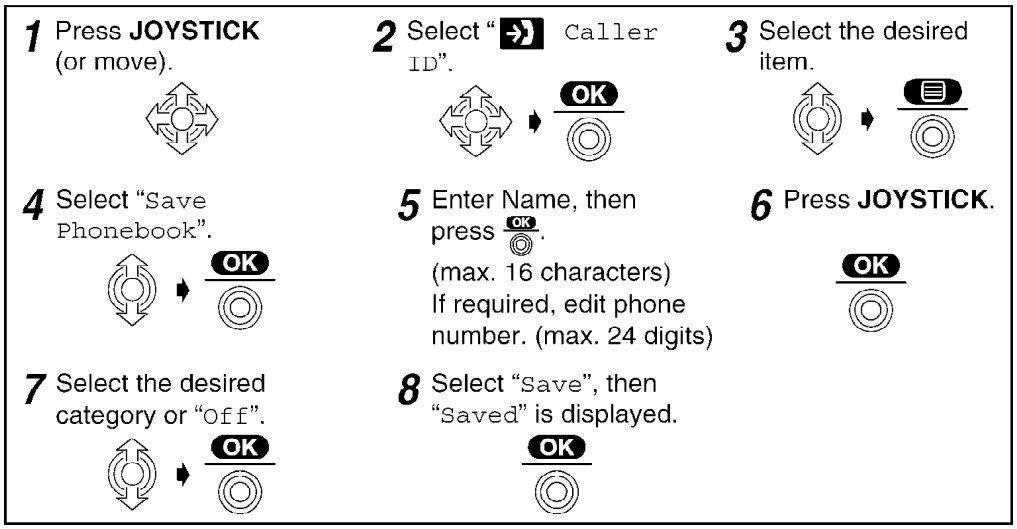
· The following small (or capital) letters of Greek, Russian (Cyrillic), Polish, Czech and Slovakian are not available. Then same letter as capital (or small) will be displayed. ą ć č ę ł ľ ń Ø ŕ ş ś š ť Ù ŵ Y Ỳ Ź ż ž

· Press * to change letter size; Capital > Small, Small > Capital.

8.4.4. Storing the Number in the Handset Phonebook

From the Caller ID List Menu

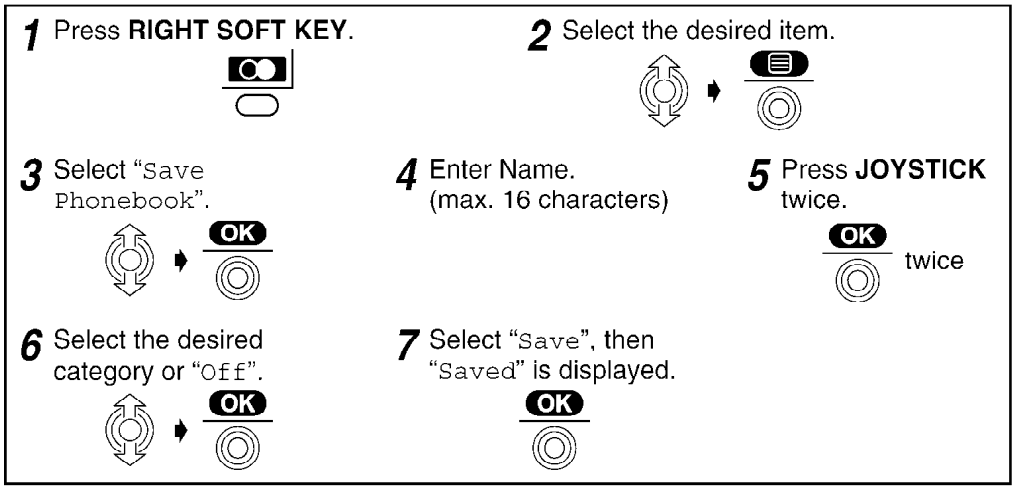
To exit the operation, press ⏻ at any time.



- If the items are scrolled at the end when you search for the desired item, an end tone sounds.
- If there is no item stored in the caller list when "Caller ID" is selected, the display shows "Memory Empty".

From the Redial List Menu

To exit the operation, press ⏻ at any time.



- If there is no item stored in the redial list when pressing ▭, the display shows "Memory Empty".

8.4.5. Hot Keys (: Speed Dial)

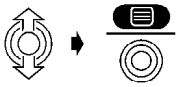
You can assign the dialling buttons 1 through 9 as hot keys. You can choose 9 phone numbers from the phonebook.

To exit the operation, press at any time.

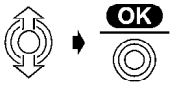
Registering a Phone Number as a Hot Key

1 Press **LEFT SOFT KEY**.

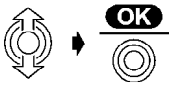
2 Select the desired item.



3 Select "Reg. to Hot Key".



4 Select the desired dialling button number.



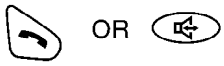
5 Select "Save", then "Saved" is displayed.

- If there are no items stored in the phonebook when searching for the desired item, the display shows "Memory Empty".
- If an item is already stored to a hot key, "✓" will be displayed on the left of the key number. If a hot key number with "✓" is selected, press "OK" to select "Overwrite".

Dialling with a Hot Key

1 Press and hold the dialling button registered as a hot key until a phone number is displayed.

2 Press **TALK** or **SPEAKERPHONE**.



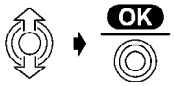
Deleting the Hot Key Registration

1 Press and hold the dialling button registered as a hot key until a phone number is displayed.

2 Press **JOYSTICK**.

3 Select "Delete".

4 Select "Yes", then "Deleted" is displayed.



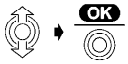
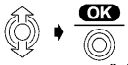
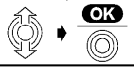
- Phonebook registration will not be erased when hot key registration is deleted.

8.4.6. Phonebook Copy

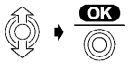
You can copy information in the handset phonebook between handsets registered to the same base unit. The phonebook copy must be performed while in intercom mode.

To exit the operation, press at any time.

Copying an Item

	<Handset 1: Receiver> (During an intercom call)	<Handset 2: Sender> (During an intercom call)
1	Press **JOYSTICK**.	
2	Select "Recv Phonebook". "Start Copying" is displayed. 	
3		Press **JOYSTICK**.
4		Select "Send Phonebook".
5		Select the desired item to copy. 
6		Select "Copy One Item" then "Start Copying" is displayed. 

Copying All Items

	<Handset 1: Receiver> (During an intercom call)	<Handset 2: Sender> (During an intercom call)
1	Press **JOYSTICK**.	
2	Select "Recv Phonebook". "Start Copying" is displayed. 	
3		Press **JOYSTICK**.
4		Select "Send Phonebook".
5		Press **JOYSTICK**.
6		Select "Copy All Items".

- When copying is completed, a beep sounds and "Copy Complete" is displayed. After a few seconds, the display will return to the intercom call. "Copy Incomplete" will be displayed if the receiver handset memory is full. If "Copy Failure" is displayed on the sender handset, the receiver did not prepare for copying.
- If you move the **JOYSTICK** up or down before pressing **JOYSTICK** on step **5**, all items will not be copied. The items, from the item indicated now to the last item, are copied.

8.5. Handset Registration to a Base Unit

The handset supplied with the base unit is already registered. If an optional handset is purchased, it must be registered as follows.

Charge the optional handset batteries for 7 hours before initial use.

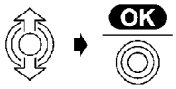
Handset registration must be completed within 1 minute after pressing . If over 1 minute, press then start over again.

To exit the operation, press at any time.

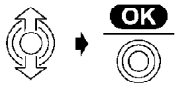
1 Press **JOYSTICK** (or move).

2 Select "Setting Handset".

3 Select "Registration".



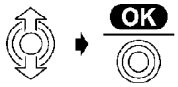
4 Select "Register H/set".



5 Press and hold on the Base Unit (for about 3 seconds) until the tone sounds.

- If all registered handset(s) start ringing (paging), press to stop paging then start over again.

6 Select the desired base unit.



7 Enter 4-digit Base Unit PIN.
(Factory Preset 0000)

8 Press **JOYSTICK**.

When a handset is registered successfully, a confirmation tone sounds and the " " icon is displayed.

- If you enter the incorrect Base Unit PIN, the error tone sounds and repeat from step 1.
- The handset main menu may change corresponding to the base unit registered to.

Note for Service:

At step 7, enter * 7 0 0 0. Finally Handset will be linked to Base Unit.

Cancelling a Handset

Each handset can cancel itself or another handset. This feature is usually used to cancel a link between Handset and Base Unit.

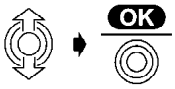
To exit the operation, press at any time.

1 Press **JOYSTICK** (or move).

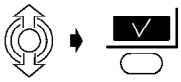
2 Select "Setting Base".

3 Enter 4-digit Base Unit PIN. (Factory Preset 0000)

4 Select "Cancel Handset".



5 Search and press **RIGHT SOFT KEY** to attach "√" to the handset(s) to cancel.



6 Press **JOYSTICK**.

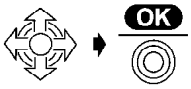
Cancelling a Base Unit

If another handset is out of range and/or power is OFF when **Cancelling a Handset**, the previous base unit number will still remain in the cancelled handset. Therefore, you need to cancel the base unit registered in the cancelled handset.

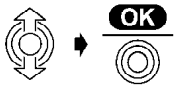
To exit the operation, press at any time.

1 Press **JOYSTICK** (or move).

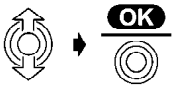
2 Select "Setting Handset".



3 Select "Registration".

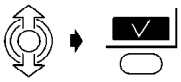


4 Select "Cancel Base".



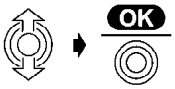
5 Enter 4-digit Handset PIN. (Factory Preset 0000)

6 Search and press **RIGHT SOFT KEY** to attach "√" to the base unit to cancel.



7 Press **JOYSTICK**.

8 Select "Yes"., then "Deleted" is displayed.



8.6. Base Unit Selection

When "Auto" (Automatic Base Unit Selection) is selected, the handset automatically searches for other registered base units if you move outside of the radio range of the current base unit.
When a specified base unit is selected, the handset will access that base unit only. Calls (both incoming and outgoing) can be conducted only via the selected base unit, even if the radio cells overlap with neighbouring base units.

To exit the operation, press ⏻ at any time.

1 Press **JOYSTICK** (or move).

2 Select "Setting Handset". OK

3 Select "Select Base". OK

4 Select "Auto" or desired base unit. OK

9. DISASSEMBLY INSTRUCTIONS

9.1. Base Unit

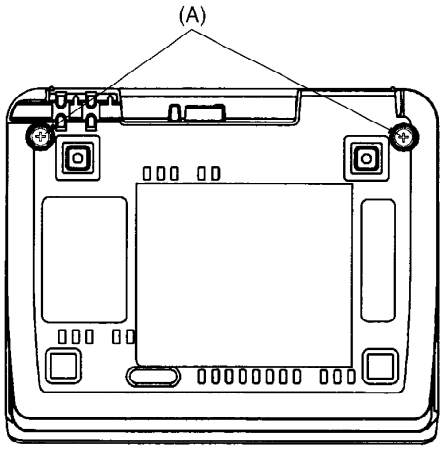


Fig. 1

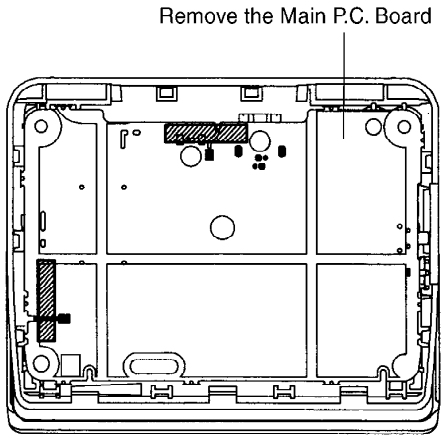


Fig. 2

Shown in Fig.-	To Remove	Remove
1	Lower Cabinet	Screws (2.6 × 12).....(A) × 2
2	Main P.C. Board	Main P.C. Board

9.2. Handset

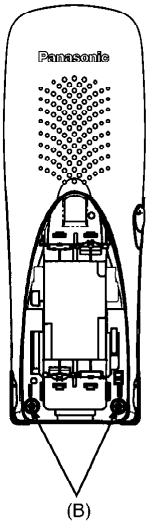


Fig.3

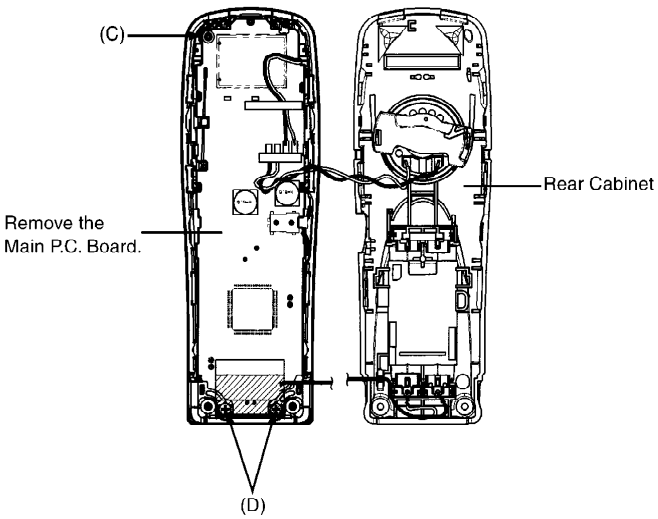
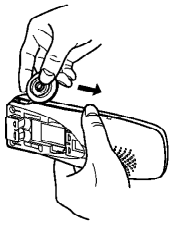
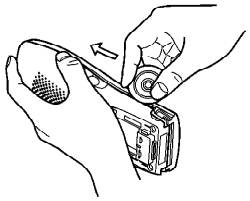


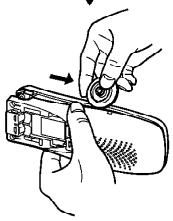
Fig.5

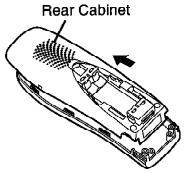


Insert a JIG (PQDJ10006Y) between the Front and the Rear Cabinet, then pull it along the gap to open the Cabinet.



Likewise, open the other side of the Cabinet.





Remove the Rear Cabinet by pushing it upward.

Fig.4

Shown in Fig.-	To Remove	Remove
3	Rear Cabinet	Screws (2 × 10).....(B) × 2
4		Follow the procedure.
5	Main P.C. Board	Screw (2 × 8).....(C) × 1
		Screws (2 × 8).....(D) × 2
		Main P.C. Board

9.3. Charger Unit

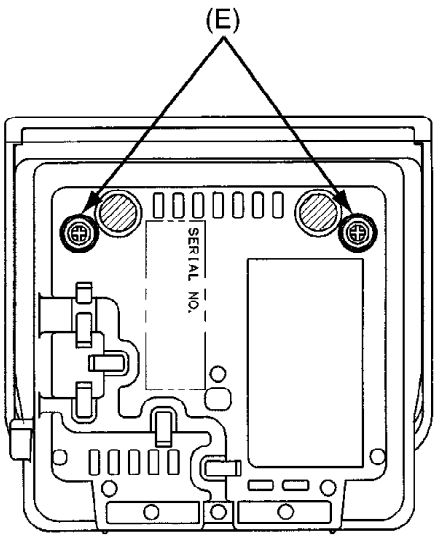


Fig. 6

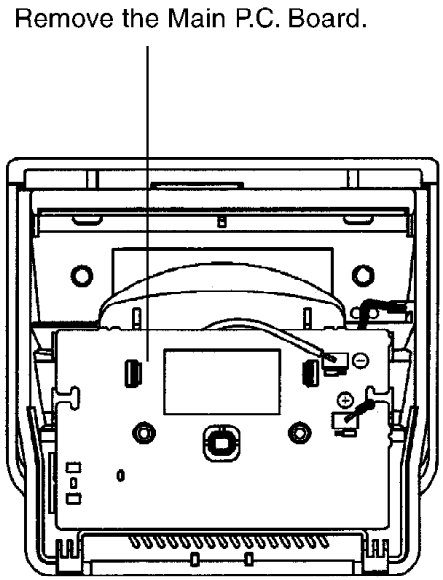


Fig. 7

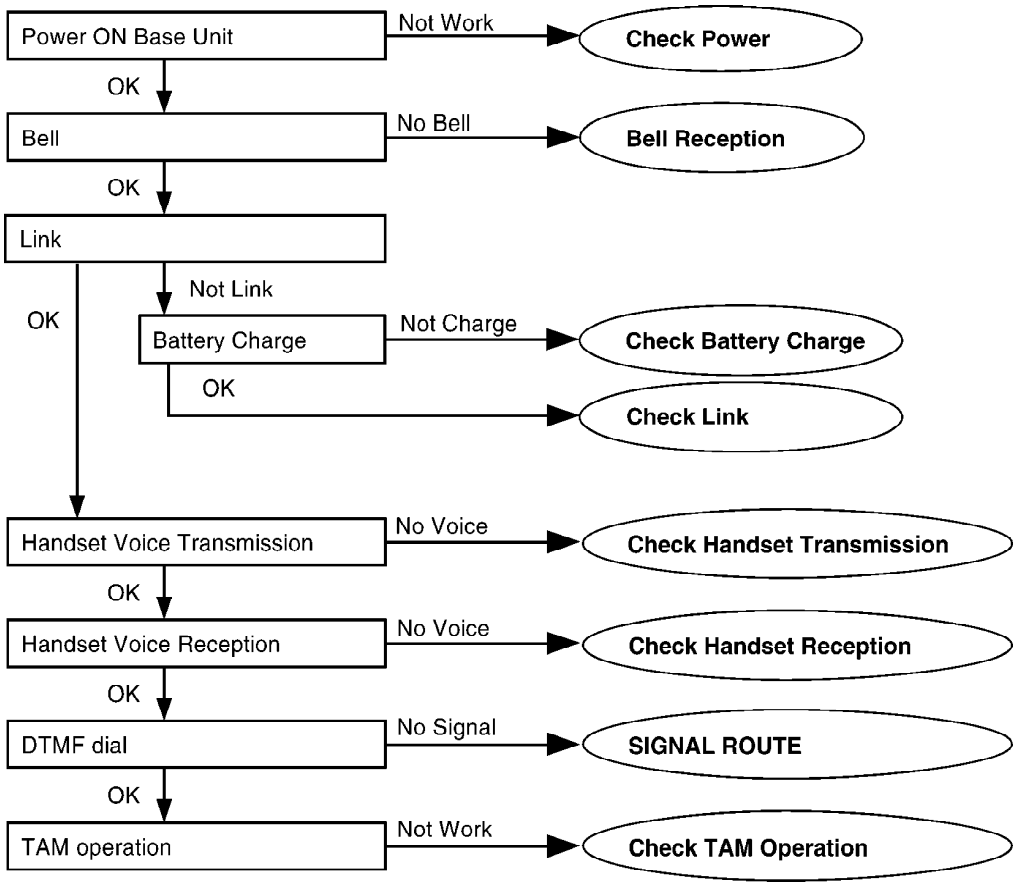
Shown in Fig.-	To Remove	Remove
6	Lower Cabinet	Screws (2.6 × 14).....(E) × 2
7	Main P.C. Board	Main P.C. Board

10. ASSEMBLY INSTRUCTIONS

10.1. Warning When Constructing the Base Unit

11. TROUBLESHOOTING GUIDE

Flow Chart

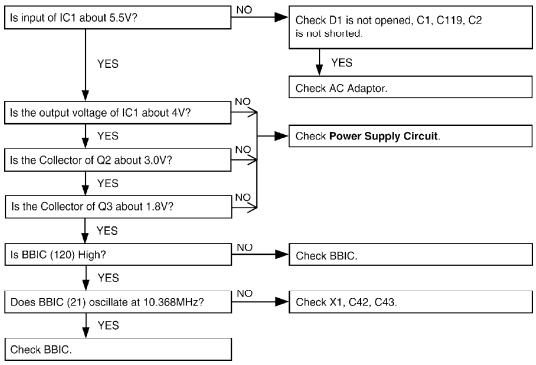


Cross Reference:
Check Power ()
Bell Reception ()
()
()
()
()
()
()

11.1. Check Power

11.1.1. Base Unit

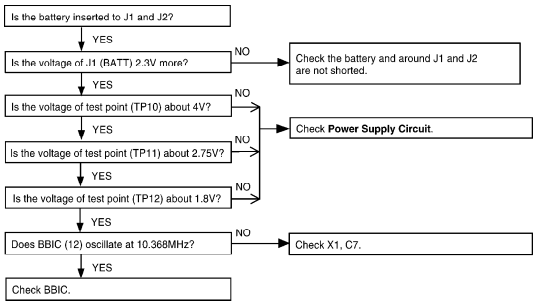
Is the AC Adaptor inserted into AC outlet? (Check AC Adaptor's specification.)



Cross Reference
()

Note:
BBIC is IC2.

11.1.2. Handset

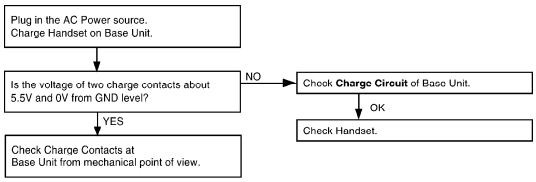


Cross Reference
()

Note:
BBIC is IC1.

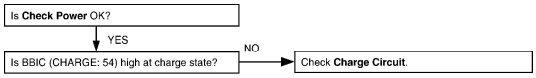
11.2. Check Battery Charge

11.2.1. Base Unit


Plug in the AC Power source.
Charge Handset on Base Unit.
Is the voltage of two charge contacts about 5.5V and 0V from GND level?
NO
Check Charge Circuit of Base Unit.
OK
Check Handset.
YES
Check Charge Contacts at Base Unit from mechanical point of view.

Cross Reference:
()

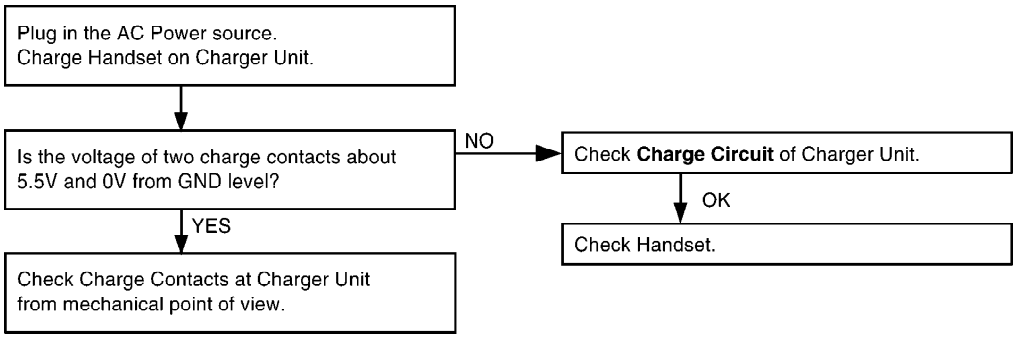
11.2.2. Handset



Cross Reference:
()
()

Note:
BBIC is IC1.

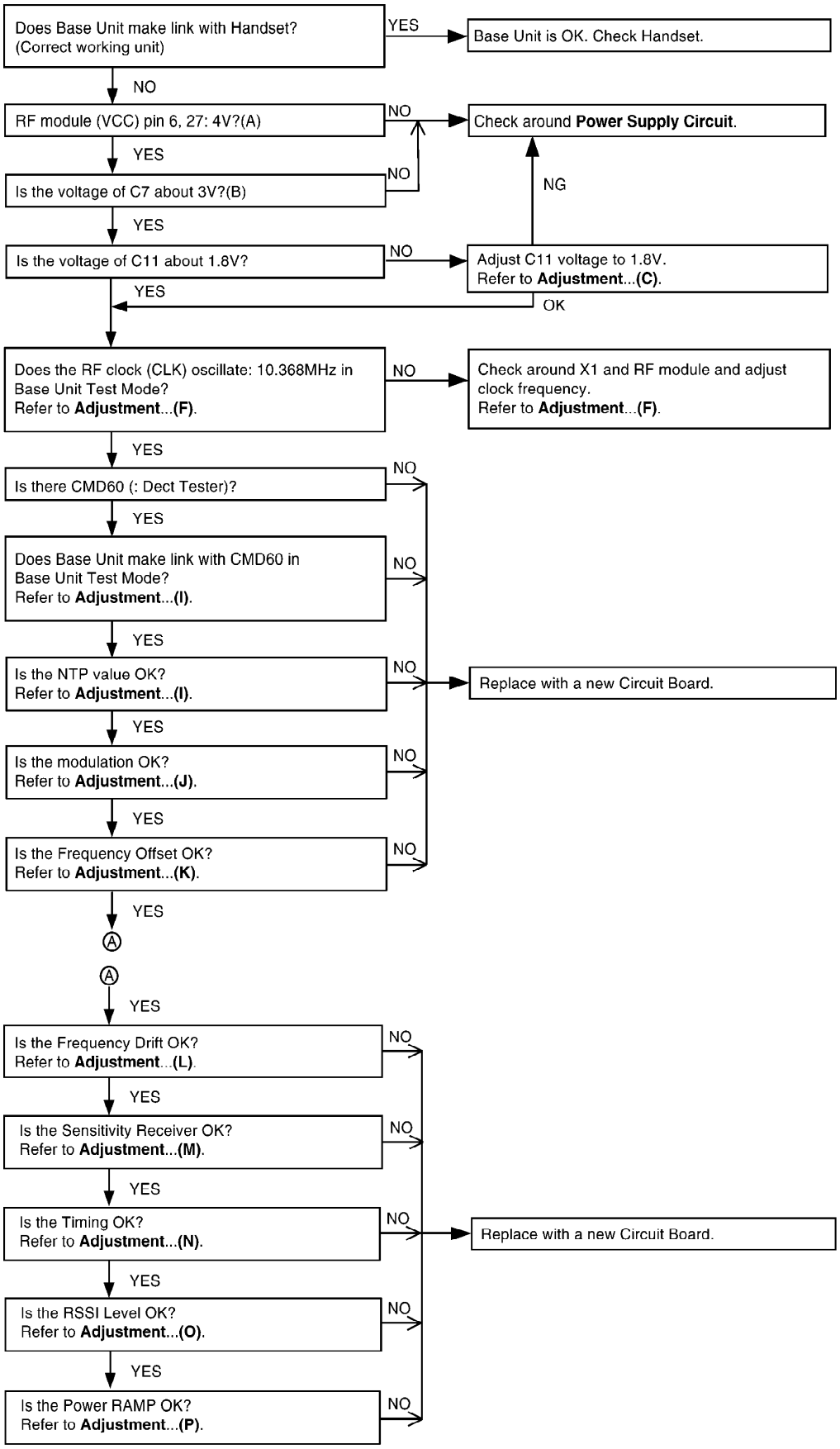
11.2.3. Charger Unit


Plug in the AC Power source.
Charge Handset on Charger Unit.
Is the voltage of two charge contacts about 5.5V and 0V from GND level?
NO
Check Charge Circuit of Charger Unit.
OK
Check Handset.
YES
Check Charge Contacts at Charger Unit from mechanical point of view.

Cross Reference:
()

11.3. Check Link

11.3.1. Base Unit

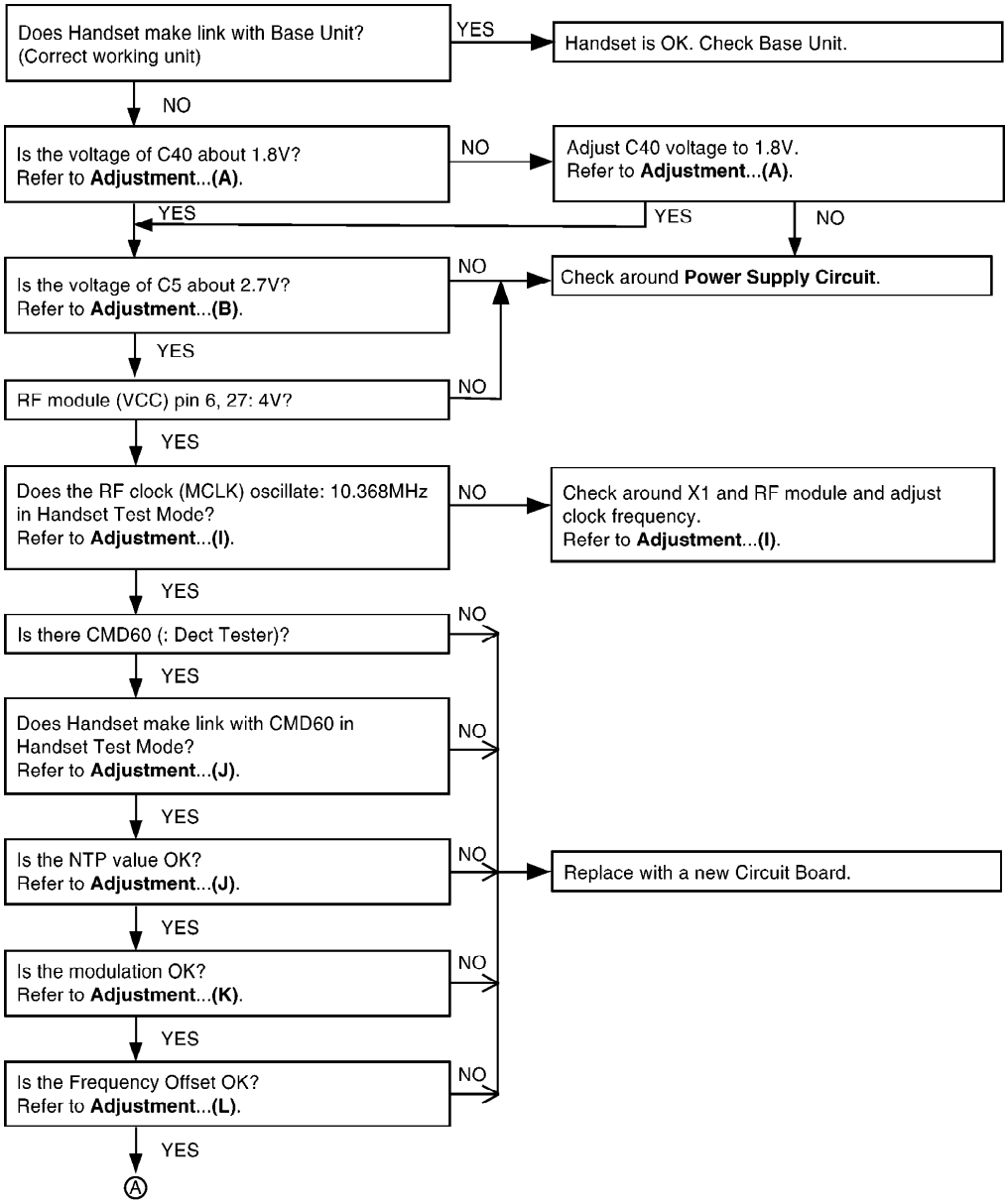

Does Base Unit make link with Handset? (Correct working unit)
YES
Base Unit is OK. Check Handset.
NO
RF module (VCC) pin 6, 27: 4V?(A)
NO
Check around Power Supply Circuit.
YES
Is the voltage of C7 about 3V?(B)
NO
NG
YES
Is the voltage of C11 about 1.8V?
NO
Adjust C11 voltage to 1.8V. Refer to Adjustment...(C).
YES
OK
Does the RF clock (CLK) oscillate: 10.368MHz in Base Unit Test Mode? Refer to Adjustment...(F).
NO
Check around X1 and RF module and adjust clock frequency. Refer to Adjustment...(F).
YES
Is there CMD60 (: Dect Tester)?
NO
YES
Does Base Unit make link with CMD60 in Base Unit Test Mode? Refer to Adjustment...(I).
NO
YES
Is the NTP value OK? Refer to Adjustment...(I).
NO
Replace with a new Circuit Board.
YES
Is the modulation OK? Refer to Adjustment...(J).
NO
YES
Is the Frequency Offset OK? Refer to Adjustment...(K).
NO
YES
A
A
YES
Is the Frequency Drift OK? Refer to Adjustment...(L).
NO
YES
Is the Sensitivity Receiver OK? Refer to Adjustment...(M).
NO
YES
Is the Timing OK? Refer to Adjustment...(N).
NO
Replace with a new Circuit Board.
YES
Is the RSSI Level OK? Refer to Adjustment...(O).
NO
YES
Is the Power RAMP OK? Refer to Adjustment...(P).
NO

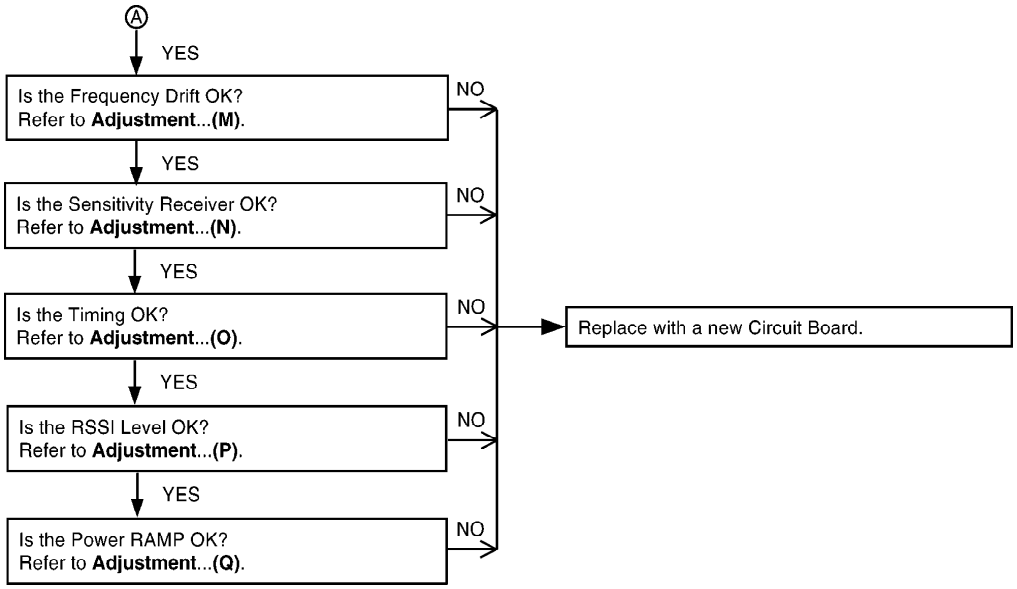
Cross Reference:

()

()

11.3.2. Handset


Does Handset make link with Base Unit? (Correct working unit)
YES
Handset is OK. Check Base Unit.
NO
Is the voltage of C40 about 1.8V? Refer to **Adjustment...(A)**.
NO
Adjust C40 voltage to 1.8V. Refer to **Adjustment...(A)**.
YES
YES
NO
Is the voltage of C5 about 2.7V? Refer to **Adjustment...(B)**.
NO
Check around **Power Supply Circuit**.
YES
RF module (VCC) pin 6, 27: 4V?
NO
YES
Does the RF clock (MCLK) oscillate: 10.368MHz in Handset Test Mode? Refer to **Adjustment...(I)**.
NO
Check around X1 and RF module and adjust clock frequency. Refer to **Adjustment...(I)**.
YES
Is there CMD60 (: Dect Tester)?
NO
YES
Does Handset make link with CMD60 in Handset Test Mode? Refer to **Adjustment...(J)**.
NO
YES
Is the NTP value OK? Refer to **Adjustment...(J)**.
NO
Replace with a new Circuit Board.
YES
Is the modulation OK? Refer to **Adjustment...(K)**.
NO
YES
Is the Frequency Offset OK? Refer to **Adjustment...(L)**.
NO
YES
Ⓐ

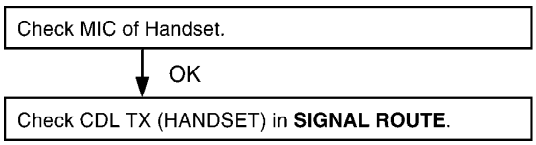


Cross Reference

()

()

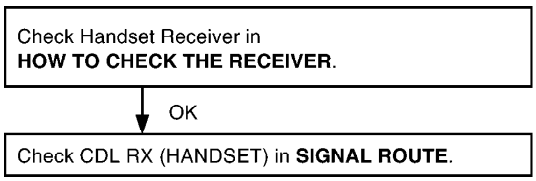
11.4. Check Handset Transmission



Cross Reference:

()

11.5. Check Handset Reception



Cross Reference:

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()

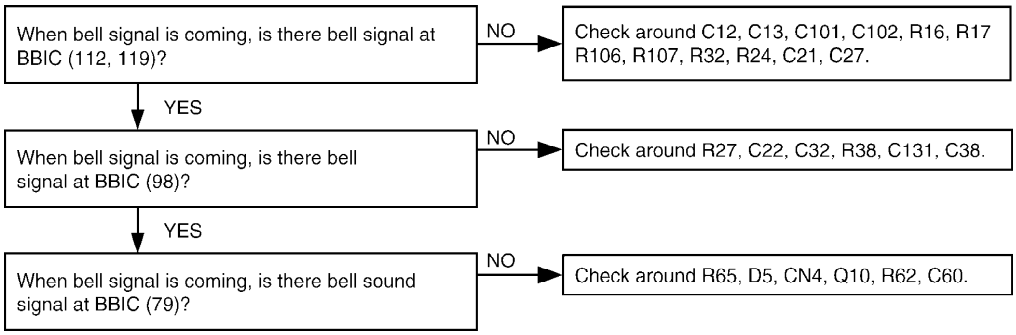
11.6. Check Caller ID

Cross Reference:

()

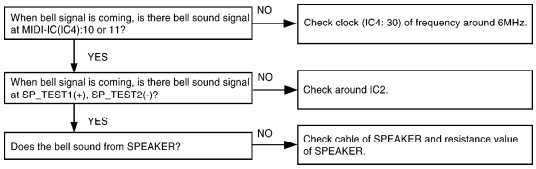
11.7. Bell Reception

11.7.1. Base Unit


When bell signal is coming, is there bell signal at BBIC (112, 119)?
NO
Check around C12, C13, C101, C102, R16, R17 R106, R107, R32, R24, C21, C27.
YES
When bell signal is coming, is there bell signal at BBIC (98)?
NO
Check around R27, C22, C32, R38, C131, C38.
YES
When bell signal is coming, is there bell sound signal at BBIC (79)?
NO
Check around R65, D5, CN4, Q10, R62, C60.

Note:
BBIC is IC2.

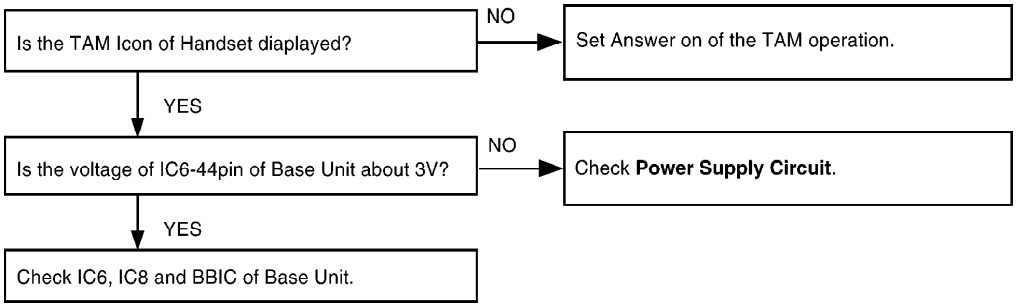
11.7.2. Handset


When bell signal is coming, is there bell sound signal at MIDI-IC(IC4):10 or 11?
NO
Check clock (IC4: 30) of frequency around 6MHz.
YES
When bell signal is coming, is there bell sound signal at SP_TEST1(+), SP_TEST2(-)?
NO
Check around IC2.
YES
Does the bell sound from SPEAKER?
NO
Check cable of SPEAKER and resistance value of SPEAKER.

Cross Reference:
()
()
()

Note:
BBIC is IC1.

11.8. Check TAM Operation


Is the TAM Icon of Handset diaplayed?
NO
Set Answer on of the TAM operation.
YES
Is the voltage of IC6-44pin of Base Unit about 3V?
NO
Check **Power Supply Circuit**.
YES
Check IC6, IC8 and BBIC of Base Unit.

Cross Reference:
()

Note:
BBIC is IC2.

12. CHECK PROCEDURE (BASE UNIT)

12.1. Preparation

12.1.1. Equipment Required

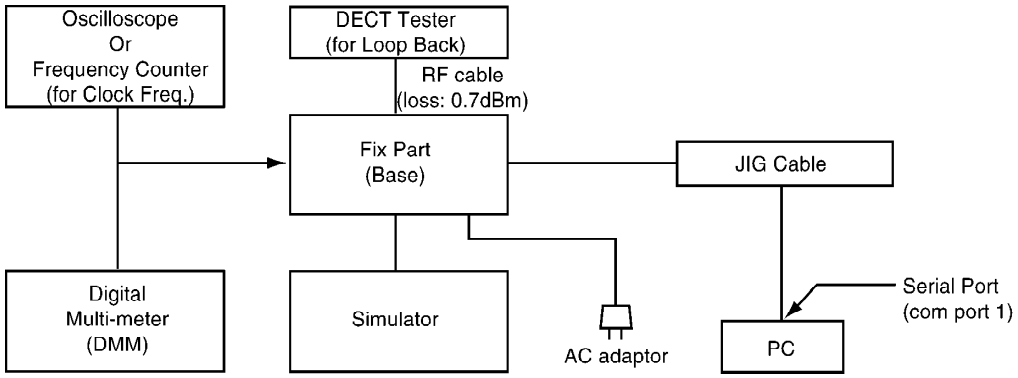
- DECT tester: Rohde & Schwarz, CMD 60 is recommended.
- Frequency counter: it must be precise to be able to measure 1Hz (precision; ± 4ppm).
Hewlett Packard, 53131A is recommended.
- DC power: it must be able to output at least 1A current under 9V.
- Digital multi-meter (DMM): it must be able to measure voltage and current.
- Oscilloscope

12.1.2. JIG and PC

- EEPROM serial JIG
JIG Cable: PQZZ1CD505E
- PC which runs in DOS mode
- Batch file for setting: PQZZTCD510AL

12.2. PC Setting

12.2.1. Connections



12.2.2. PC Setting

1. Open a window of MS-DOS mode from the start-up menu.

2. Change a directory.

3. Type “SET_COM 1” from the keyboard (when COM port 1 is used for the connection).

4. Type “doskey”.

Note:
See the table below for frequently used commands.

Command name	Function	Example
rdeeprom	Read the data of EEPROM	Type “rdeeprom 00 00 FF”, and the data from address “00 00” to “FF” is read out.
readid	Read ID (RFPI)	Type “readid”, and the registered ID is read out.
writeid	Write ID (RFPI)	Type “writeid 00 18 E0 0E 98”, and the ID “0018 E0 0E 98” is written.
setfreq	adjust Frequency of RFIC	Type “setfreq nn”.
hookoff	off-hook mode on Base	Type “hookoff”.
hookon	on-hook mode on Base	Type “hookon”.
Getchk	Read checksum	Type “getchk”.
Wreeprom	write eeprom	Type "wreeprom 01 23 45". "01 23" is address and "45" is data to be written.

13. CHECK PROCEDURE (HANDSET)

13.1. Preparation

13.1.1. Equipment Required

- DECT tester: Rohde & Schwarz, CMD 60 is recommended.
- Frequency counter: it must be precise to be able to measure 1Hz (precision; ± 4ppm).
  Hewlett Packard, 53131A is recommended.
- DC power: it must be able to output at least 1A current under 2.4V for Handset, 9V for JIG.
- Digital multi-meter (DMM): it must be able to measure voltage and current.
- Oscilloscope

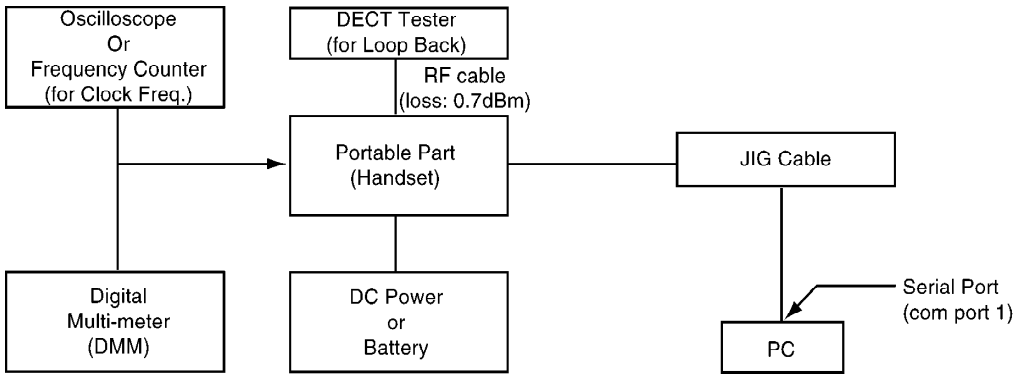
13.1.2. JIG and PC

- EEPROM serial JIG
  JIG Cable: PQZZ1CD505E

- PC which runs in DOS mode.
- Batch file for PC setting: PQZZTCD510AL

13.2. PC Setting

13.2.1. Connections



13.2.2. PC Setting

1. Open a window of MS-DOS mode from the start-up menu.
2. Change a directory.
3. Type “SET_COM 1” from the keyboard (when COM port 1 is used for the connection).
4. Type “doskey”.

Note:
See the table below for frequently used commands.

Command name	Function	Example
rdeeprom	Read the data of EEPROM	Type “rdeeprom 00 00 FF”, and the data from address “00 00” to “FF” is read out.
readid	Read ID (RFPI)	Type “readid”, and the registered ID is read out.
writeid	Write ID (RFPI)	Type “writeid 00 18 E0 0E 98”, and the ID “0018 E0 0E 98” is written.
setfreq	adjust Frequency of RFIC	Type “setfreq nn”.
Getchk	Read checksum	Type “getchk”.
Wreeprom	write eeprom	Type "wreeprom 01 23 45". "01 23" is address and "45" is data to be written.

14. ADJUSTMENTS (BASE UNIT AND CHARGER UNIT)

If your unit have below symptoms, adjust or confirm each item using remedy column from the table.

Symptom	Remedy*
The base unit does not respond to a call from handset.	Make adjustments in item (I)~(O).
The base unit does not transmit or the transmit frequency is off.	Make adjustments in item (I)~(L), (N).
The transmit frequency is off.	Make adjustments in item (I)~(L), (N).
The transmit power output is low, and the operating distance between base unit and handset is less than normal.	Make confirmation in item
The reception sensitivity of base unit is low with noise.	Make confirmation in item
The transmit level is high or low.	Make confirmation in item
The reception level is high or low.	Make confirmation in item
The unit does not link.	Make adjustments in item
The unit cannot charge.	Make confirmation in item
TAM does not work.	Make confirmation in item

*** : Refer to ()**

14.1. Adjustment (Base Unit)

Please follow the items below when BBIC or EEPROM or FLASH ROM are replaced.

	Items	Adjustment Point	Procedure	
(A)	4.0V Supply Confirmation	TP14	1. Confirm that the voltage between TP14 and GND is 4.0V ± 0.2V.	
(B)	3.0V Supply Confirmation	TP22	1. Confirm that the voltage between TP22 and GND is 3.0V ± 0.2V.	

<table>
<tr><th></th><th>Items</th><th>Adjustment Point</th><th>Procedure</th></tr>
<tr><td>(C) *</td><td>1.8V Supply Confirmation</td><td>TP15</td><td>1. Confirm that the voltage between TP15 and GND is 1.8V ± 0.02V.
2. Adjust the 1.8V voltage of TP15 executing the command “bandgap XX“ (XX is the value).</td></tr>
<tr><td>(D) *</td><td>BBIC Confirmation</td><td>-</td><td>1. BBIC Confirmation (Execute the command "getchk").
2. Confirm the returned checksum value.

Connection of checksum value and program number is shown below.
ex.)<table><tr><th>checksum value</th><th>program number</th></tr><tr><td>383D</td><td>D312ZE</td></tr></table></td></tr>
<tr><td>(E) *</td><td>EEP-ROM Confirmation</td><td>-</td><td>1. EEP-ROM Confirmation (Execute the command "Chk510ALHv02.bat").
2. Confirm the returned checksum value (Checksum is 1A9C0).</td></tr>
<tr><td>(F) *</td><td>BBIC Clock Adjustment</td><td>TP17</td><td>1. Execute the command ”Conttx”.
2. Input Command “rdeeprom 02 86 01”, then you can confirm the current value.
3. Adjust the frequency of TP17 executing the command "setfreq xx (where xx is the value)" so that the reading of the frequency counter is 10.368000MHz ± 10Hz.</td></tr>
<tr><td>(G) *</td><td>Hookswitch Check with DC Characteristics</td><td>-</td><td>1. Connect CN1 (Telephone Socket) to Tel-simulator which is connected with 600 Ω.
2. Set line voltage to 48V at on-hook condition and line current to 40mA at off-hook condition of nomal telephone.
3. Execute the command "hookoff"
4. Confirm that the line current is 40mA ± 5mA.
5. Execute the command "hookon".
6. Confirm that the line current is 0mA + 0.2mA.</td></tr>
<tr><td>(H) *</td><td>DTMF Generator Confirmation</td><td>-</td><td>1. Connect CN1 (Telephone Socket) to DTMF tester.
2. Execute the command "hookoff" and "dtmf_Hi".
3. Confirm that the high frequency (1477.06Hz) group is -8dBm ~ ± 2dB.
4. Execute the command "dtmf_lo".
5. Confirm that the low frequency (852.05Hz) group is -10dBm ~ ± 2dB.</td></tr>
</table>

	Items	Adjustment Point	Procedure	C
(I)*	Transmitted Power Confirmation	-	**Remove the Antenna before starting step from 1 to 7.** 1. Configure the DECT tester (CMD60) as follows; <Setting> -Test mode: FP -Traffic Carrier: 5 -Traffic Slot: 4 -Mode: Loopback -PMID: 0000 -RF LEVEL = -70dBm. 2. Execute the command "testmode". 3. Execute the command “sendchar dmv 2 2“. 4. Check that “Signalling Status” has been set to “Locked“, then press “ACCEPT RFPI“. 5. Initiate connection from Dect tester (“set up connect“) 6. Execute the command “ant0“. 7. Confirm that the NTP value at ANT is 20dBm ~ 25dBm.	
(J)	Modulatoin Check and Adjustment	ANT	**Follow steps 1 to 6 of (I) above.** **7.Confirm that the B-Field Modulation is 360kHz/div ~ 380kHz /div using data type Fig31.** **8.Adjust the B-Field Modulation if required. (Execute the command "readmod" and "wrtmod xx", where xx is the value.)**	

	Items	Adjustment Point	Procedure	C
(K)	Frequency Offset Confirmation	-	Follow steps 1 to 6 of (I) above. 7.Confirm that the frequency offset is < ± 50kHz.	
(L)	Frequency Dirft Confirmation	-	Follow steps 1 to 6 of (I) above. 7.Confirm that the frequency drift is < ± 30kHz/ms.	

	Items	Adjustment Point	Procedure	C
(M)	Sensitivity Receiver Confirmation	-	Follow steps 1 to 6 of (I) above. 7.Set DECT tester power to -88dBm. 8.Confirm that the BER is < 1000ppm.	
(N)	Timing Confirmation	-	Follow steps 1 to 6 of (I) above. 7.Confirm that the Timing accuracy is < ± 2.0ppm.	

	Items	Adjustment Point	Procedure	C
(O) *	RSSI Level Confirmation	-	Follow steps 1 to 6 of (I) above. 7.Execute the command "readrssi". 8. Confirm:11<returned value< 25(hex)	
(P)	Power RAMP Confirmation	-	Follow steps 1 to 6 of (I) above. 7.Confirm that “Power RAMP is Matching“.	

	Items	Adjustment Point	Procedure	C
(Q) *	Audio Check	-	1. Link with Handset. 2. Input -45dBm/1kHz to MIC of Handset. Measure the Level at Line I/F and distortion level. 3. Confirm that the level is -14dBm ± 5dB and confirm that the distortion level is < 5% at TEL Line(600 Ω Road). 4. Input -20dBm/1kHz to Line I/F. Measure the level at Receiver of Handset and distortion level (*Receive volume set to middle). 5. Confirm that the level is -25.5dBm ± 5dB and confirm that the distortion level is < 5% at Receiver(Volume Middle,150 Ω Road).	I LE F
(R)	Charging Check	-	1. Connect Charge Contact 12 Ω /2W register between charge+ and charge-. 2. Measure and confirm voltage across the regigster is 2.85V ± 0.2V.	D I
(S) *	TAM Operation Confirmation	-	1. TAM Confirmation (Execute the command “chktam“). 2. Confirm the returned Value (Value is “01“).	C R

Note:
After the measuring, sock up the solder of TP.
*** : PC Setting () is required beforehand.**
The connection of adjustment equipment are as shown in Adjustment Standard (Base Unit) ().

14.2. Adjustment Standard (Base Unit)

When connecting the Simulator Equipments for checking, please refer to below.

14.2.1. Component View

Note:
(I) - (P) is refered to ADJUSTMENTS (BASE UNIT AND CHARGER UNIT) ()

14.2.2. Flow Solder Side View

Note:
(A) - (Q) is refered to ADJUSTMENTS (BASE UNIT AND CHARGER UNIT) ()

14.3. Adjustment (Charger Unit)

	Items	Adjustment Point	Procedure	
(A)	Charging Check	-	1. Connect Charge Contact 12 Ω /2W register between charge+ and charge-. 2. Measure and confirm voltage across the regigster is 2.7V ± 0.2V.	

Note:
After the measuring, sock up the solder of TP.
The connection of adjustment equipment are as shown in Adjustment Standard (Charger Unit) ().

14.4. Adjustment Standard (Charger Unit)

When connecting the Simulator Equipments for checking, please refer to below.

14.4.1. Flow Solder Side View

Note:
(A) is refered to ADJUSTMENTS (BASE UNIT AND CHARGER UNIT) ()

15. ADJUSTMENTS (HANDSET)

If your unit have below symptoms, adjust or confirm each item using remedy column from the table.

Symptom	Remedy*
The movement of Battery Low indicator is wrong.	Make adjustments in item (A)~).
The handset does not respond to a call from base unit.	Make adjustments in item (A)~
The handset does not transmit or the transmit frequency is off.	Make adjustments in item (A)~ (M), (O).
The transmit frequency is off.	Make adjustments in item (A)~ (M), (O).
The transmit power output is low, and the operating distance between base unit and handset is less than normal.	Make confirmation in item (J),
The reception sensitivity of base unit is low with noise.	Make confirmation in item (N).
Does not link between base unit and handset.	Make adjustments in item (A)~
The Audio level is high or low.	Make confirmation in item (R).
The SP-Phone level is high or low.	Make confirmation in item (S).
The Headset level is high or low.	Make confirmation in item (T).

*** : Refer to Adjustment (Handset) ()**

15.1. Adjustment (Handset)

Please follow the items below when BBIC or EEPROM is replaced.

<table>
<tr><th></th><th>Items</th><th>Adjustment Point</th><th>Procedure</th></tr>
<tr><td>(A) *</td><td>1.8V Supply Confirmation</td><td>TP12</td><td>1. Confirm that the voltage between test point “TP12” and GND is 1.8V ± 0.02V.
2. Adjust the 1.8V voltage of TP12 executing command “bandgap XX“ (XX is the value).</td></tr>
<tr><td>(B)</td><td>4.0V Supply Confirmation</td><td>TP10</td><td>1. Confirm that the voltage between “TP10” and GND is 3.85V ± 0.2V.</td></tr>
<tr><td>(C)</td><td>2.7V Supply Confirmation</td><td>TP11</td><td>1. Confirm that the voltage between “TP11” and GND is 2.7V ± 0.1V.</td></tr>
<tr><td>(D) *</td><td>BBIC Confirmation</td><td>-</td><td>1. BBIC Confirmation (Execute the command "getchk").
2. Confirm the returned checksum value.

Connection of checksum value and program number is shown below.
ex.)<table><tr><th>checksum value</th><th>program number</th></tr><tr><td>6458</td><td>D312ZE</td></tr></table></td></tr>
<tr><td>(E)</td><td>Charge Control Check & Charge Current Monitor Confirmation</td><td>-</td><td>1. Apply 6V between J3(+) and J4(-) with current limit of PSU to 200mA.
2. Confirm that the charge current is ON/OFF.
3. SW to decrease current limit of PSU to 100mA.
4. Confirm that the charge current is stable.</td></tr>
<tr><td>(F) *</td><td>Charge Detection (OFF) Confirmation</td><td>-</td><td>1. Stop supplying 6V to J3(+) and J4(-).
2. Execute the command "charge".
3. Confirm that the returned value is 0x01 (hex).</td></tr>
</table>

	Items	Adjustment Point	Procedure
(G) *	Battery Monitor Confirmation & Adjustment	-	1. Apply 2.3V ± 0.005V between BATT(+) and BATT(-). 2. Execute the command "Backloff", then "readbatt". 3. Confirm: 29 ≦ returned value ≦ 36 (Hex) (If the returned value is within the range, no need to do step 4 and 5.) 4. If the reading is out of range in step 3 above, adjust the battery monitor excuting command "wreeprom 00 01 01 XX". (XX is the reading at step 3.) Then excute command "wreeprom 00 36 01 YY". (YY= XX - 0E)
(H)	Battery low Confirmation	-	1. Apply 2.40V between BATT(+) and BATT(-). 2. Confirm that there is no flashing of Battery Icon. 3. Apply 2.20V between BATT(+) and BATT(-). 4. Confirm that there is flashing of Battery Icon.
(I)*	BBIC Clock Adjusment	CLK	1. Execute the command "conttx". 2. Input Command "rdeeprom 00 57 01", then you can confirm the current value. 3. Adjust the frequency of CLK executing the command "setfreq xx (where xx is the value)" so that the reading of the frequency counter is 10.368000MHz ± 10Hz.
(J) *	Transmitted Power Confirmation	-	**Remove the Antenna before starting step from 1 to 4.** 1. Configure the DECT tester (CMD60) as follows; <Setting> -Test mode: PP -RFPI: 0102030408 -Traffic Carrier: 5 -Traffic Slot: 4 -Mode: Loopback -RF LEVEL = -70dBm 2. Execute the command "regcmd60 01 02 03 04 08". 3. Initiate connection from DECT tester. 4. Confirm that the NTP value at A201 (TP15) is 20dBm ~ 25dBm.
(K) *	Modulatoin Check and Adjusment	-	**Follow steps 1 to 3 of (J) above.** **4.Confirm that the B-Field Modulation is 360kHz/div ~ 380kHz/ div using data type Fig 31.** **5.Adjust the B-Field Modulation if required. (Execute the command "Readmod" and "wrtmod xx", where xx is the value.)**

	Items	Adjustment Point	Procedure
(L)	Frequency Offset Confirmation	-	Follow steps 1 to 3 of (J) above. 4.Confirm that the frequency Offset is < ± 45kHz.
(M)	Frequency Drift Confirmation	-	Follow steps 1 to 3 of (J) above. 4.Confirm that the frequency Drift is < ± 30kHz/ms.
(N)	Sensitivity Receiver Confirmation	-	Follow steps 1 to 3 of (J) above. 4.Set DECT tester power to -88dBm. 5.Confirm that the BER is < 1000ppm.

	Items	Adjustment Point	Procedure
(O)	Timing Confirmation	-	Follow steps 1 to 3 of (J) above. 4.Confirm that the Timing accuracy is < ± 0.5ppm.
(P) *	RSSI Level Confirmation	-	Follow steps 1 to 3 of (J) above. 4.Set DECT tester power to -81dBm. 5.Execute the command “readrssi“. 6.Confirm that the returned value is 0×11 ± 8 (hex). 7.Set DECT tester power to -63dBm. 8.Execute the command “readrssi“. 9.Confirm that the returned value is 0×1E ± 8 (hex).
(Q)	Power RAMP Confirmation	-	Follow steps 1 to 3 of (J) above. 4.Confirm that Power RAMP is matching.

	Items	Adjustment Point	Procedure
(R)	Audio Check and confirmation	-	1. Link to BASE which is connected to Line Simulator. 2. Set line voltage to 48V and line current to 40mA. 3. Input -45dBm/1KHz to MIC and measure Line output level. 4. Confirm that the level is -14dBm ± 5dB and confirm that the distortion level is < 5% at TEL Line(600 Ω Road). 5. Input -20dBm/1KHz to Line I/F and measure Receiving level at REV1 and REV2. 6. Confirm that the level is -23.5dBm ± 5dB and confirm that the distortion level is < 5% at Receiver(Volume Middle,150 Ω Road).
(S)	SP phone Audio check and confirmation	-	1. Link to Base which is connected to Line Simulator. 2. Set line voltage to 48V and line current to 40mA. 3. Set the handset off-hook using SP-Phone key. 4. Input -45dBm/1KHz to MIC and measure Line output level. 5. Confirm that the level is -4dBm ± 5dB and confirm that the distortion level is < 5% at TEL Line(600 Ω Road). 6. Input -20dBm/1KHz to Line I/F and measure Receiving level at SP1 and SP2. 7. Confirm that the level is -7dBm ± 5dB and confirm that the distortion level is < 5% at Receiver(Volume Middle,150 Ω Road).

	Items	Adjustment Point	Procedure
(T)	Headset Audio check and confirmation	-	1. Link to BASE which is connected to Line Simulator. 2. Set line voltage to 48V and line current to 40mA. 3. Input -45dBm/1kHz across Mic terminals on headset cable. 4. Confirm that the level is -16.5dBm ± 5dB and confirm that the distortion level is < 5% at TEL Line(600 Ω Road). 5. Input -20dBm/1kHz to Line I/F. 6. Confirm that the level is -27.5dBm ± 5dB and confirm that the distortion level is < 5% at Receiver(Volume Middle,150 Ω Road). (SP terminals on headset cable is load of 150 Ω)
(U) *	EEP-ROM confirmation	-	1. EEP-ROM Confirmation (Execute the command "Chk151ALRv03.bat"). 2. Confirm the returned check sum Value (check sum is 7534).

Note:
After the measuring, sock up the solder of TP.
*** : PC Setting () is required beforehand.**
The connection of adjustment equipment are as shown in Adjustment Standard (Handset) ().

15.2. Adjustment Standard (Handset)

When connecting the Simulator Equipments for checking, please refer to below.

Note:
(A) - (U) is refered to ADJUSTMENTS (HANDSET) ()

16. RF SPECIFICATION

16.1. Base Unit

Item	Value	Refer to -. *	Remar
TX Power	20 dBm ~ 25 dBm	Adjustment (Base Unit) (I)	
Modulation	360 kHz/div ~ 380 kHz/ div	Adjustment (Base Unit) (J)	Data type:
Frequency Offset	-45 kHz ~ +45 kHz	Adjustment (Base Unit) (K)	
Frequency Drift	< ± 30 kHz / ms	Adjustment (Base Unit) (L)	
RX Sensitivity	< 1000 ppm	Adjustment (Base Unit) (M)	
Timing Accuracy	< ± 2.0 ppm	Adjustment (Base Unit) (N)	
RSSI Level	0x1B hex ± A hex	Adjustment (Base Unit) (O)	

*** : Refer to Adjustment (Base Unit) ()**

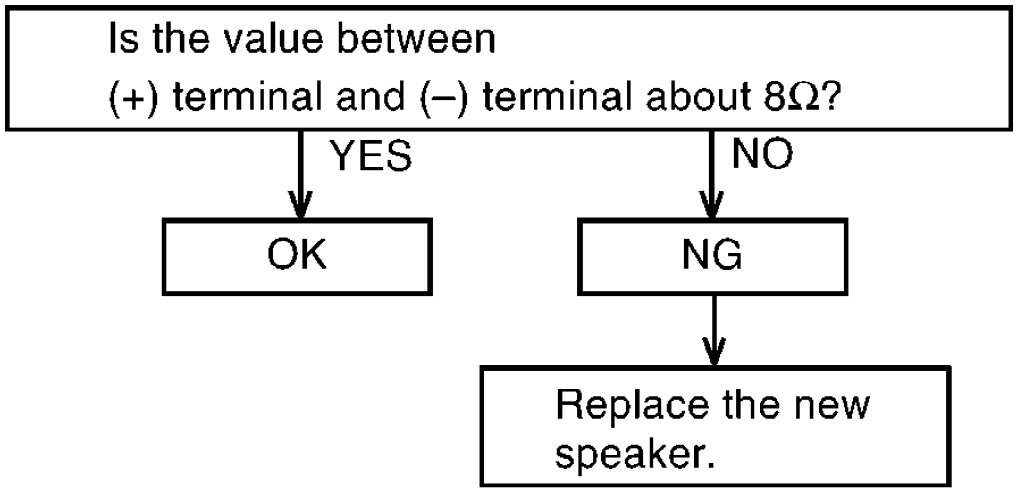
16.2. Handset

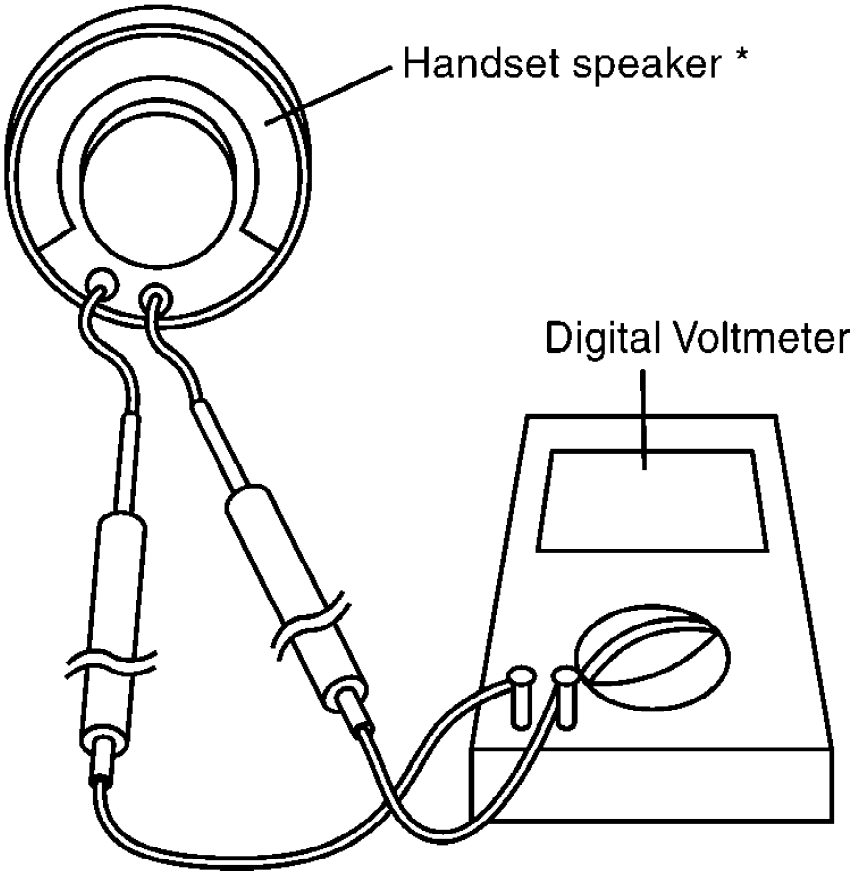
Item	Value	Refer to -. **	Remar
TX Power	20 dBm ~ 25 dBm	Adjustment (Handset) (J)	
Modulation	360 kHz/div ~ 380 kHz/ div	Adjustment (Handset) (K)	Data type:
Frequency Offset	-45 kHz ~ +45 kHz	Adjustment (Handset) (L)	
Frequency Drift	< ± 30 kHz / ms	Adjustment (Handset) (M)	
RX Sensitivity	< 1000 ppm	Adjustment (Handset) (N)	
Timing Accuracy	< ± 0.5 ppm	Adjustment (Handset) (O)	
RSSI Level	0x11 hex ± 8 hex (at -81dBm) 0x1E hex ± 8 hex (at -63dBm)	Adjustment (Handset) (P)	
Power RAMP	Power RAMP is matching	Adjustment (Handset) (Q)	

** : Refer to Adjustment (Handset) ()

17. HOW TO CHECK THE HANDSET SPEAKER

1. Prepare the digital voltmeter, and set the selector knob to ohm meter.
2. Put the probes at the speaker terminals as shown below.





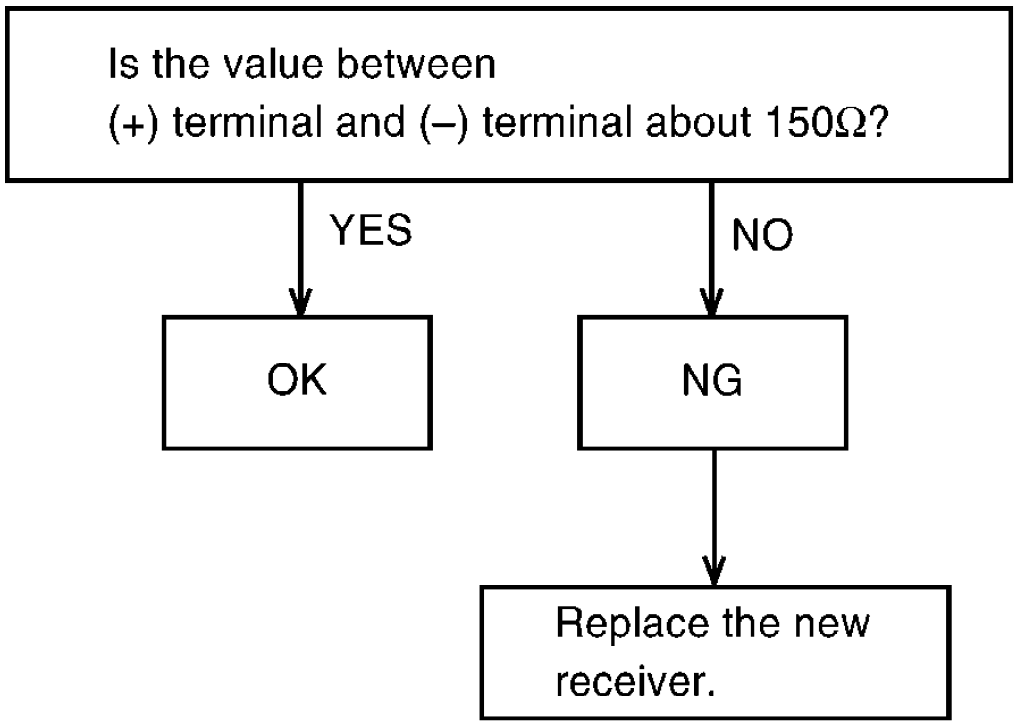
Note:

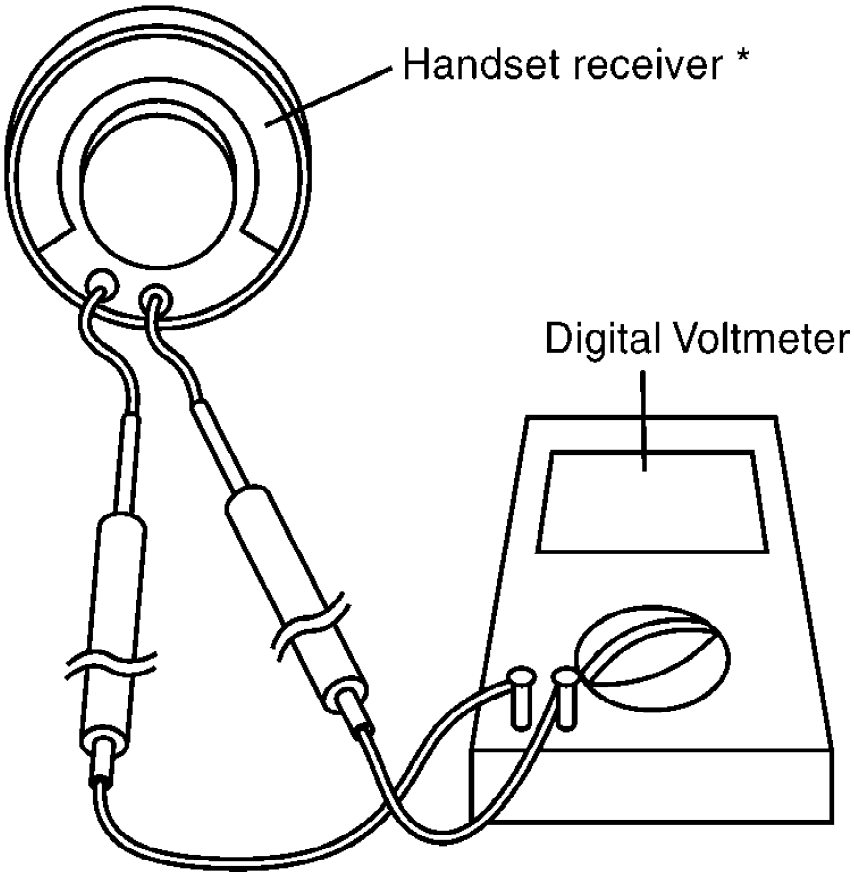
*** : Refer to Cabinet and Electrical Parts () of Handset replacement part lists.**

18. HOW TO CHECK THE HANDSET RECEIVER

1. Prepare the digital voltmeter, and set the selector knob to ohm meter.

2. Put the probes at the receiver terminals as shown below.





Note:
*** : Refer to Cabinet and Electrical Parts () of Handset replacement part lists.**

19. FREQUENCY TABLE (MHz)

	BASE UNIT		HANDSET	
Channel No	Transmit Frequency	Receive Frequency	Transmit Frequency	Receive Fr
1	1897.344	1897.344	1897.344	1897.
2	1895.616	1895.616	1895.616	1895.
3	1893.888	1893.888	1893.888	1893.
4	1892.160	1892.160	1892.160	1892.
5	1890.432	1890.432	1890.432	1890.
6	1888.704	1888.704	1888.704	1888.
7	1886.976	1886.976	1886.976	1886.
8	1885.248	1885.248	1885.248	1885.
9	1883.520	1883.520	1883.520	1883.
10	1881.792	1881.792	1881.792	1881.

Note:
Channel No. 10: In the Test Mode on Base Unit and Handset.

20. BLOCK DIAGRAM (BASE UNIT)

21. CIRCUIT OPERATION (BASE UNIT)

21.1. Outline

Base Unit consists of the following ICs as shown in BLOCK DIAGRAM (BASE UNIT) ().

- **DECT BBIC (Base Band IC): IC2**
- **Handling all the audio, signal and data processing needed in a DECT base unit**
- **Controlling the DECT specific physical layer and radio section (Burst Module Controller section)**
- **ADPCM codec filter for speech encoding and speech decoding (DSP section)**
- **Echo-cancellation and Echo-suppression (DSP section)**
- **Any tones (tone, sidetone, ringing tone, etc.) generation (DSP section)**
- **DTMF receiver (DSP section)**
- **Clock Generation for RF Module**

- ADC, DAC, timer, and power control circuitry
- All interfaces (ex: RF module, EEPROM, LED, Analog Front End, etc.)
- RF Module: IC4
- PLL Oscillator
- Detector
- Compress/Expander
- First/Second Mixer
- Amplifier for transmission and reception
- FLASH MEMORY IC7
- Program D/L (DownLoad) Area
- EEPROM: IC3
- Temporary operating parameters (for RF, etc.)

Refer to EEPROM LAYOUT (BASE UNIT) ().

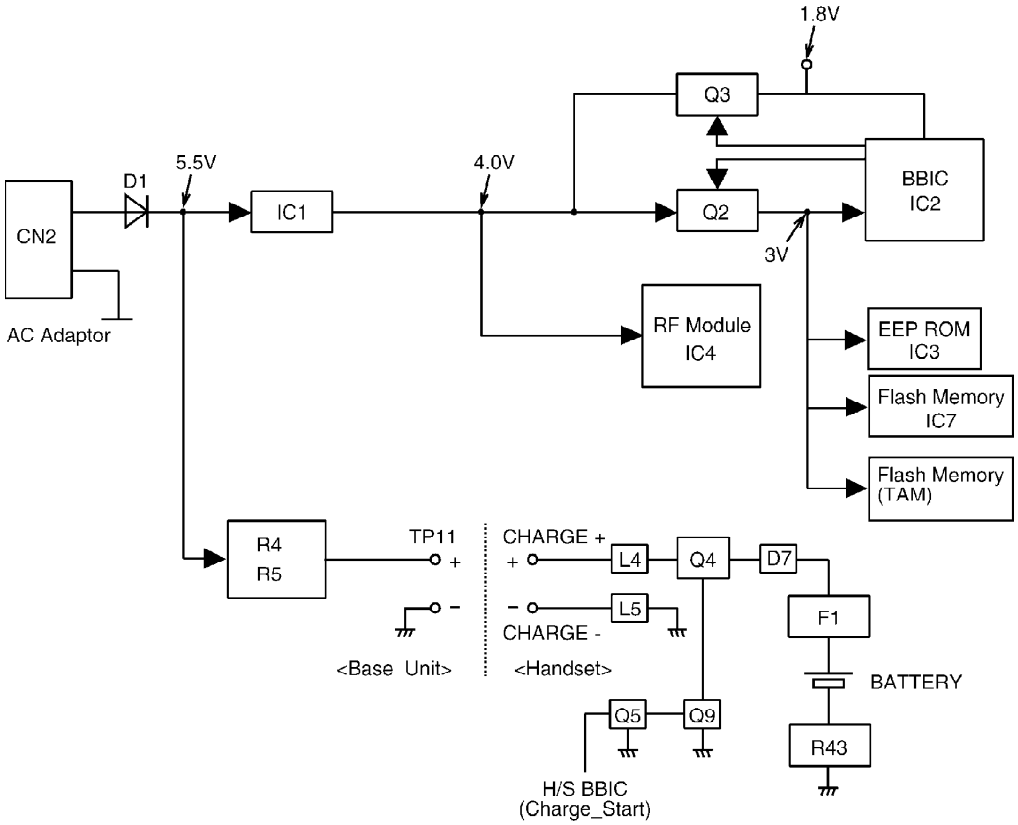
- Additionally,
- Power Supply Circuit (+4.0V, +3V, +1.8V output)
- Crystal Circuit (10.368MHz)
- Charge Circuit
- Telephone Line Interface Circuit
- FLASH MEMORY IC6
- VOICE Prompt (TAM) D/L Area

21.2. Power Supply Circuit

The power is supplied to the DECT BBIC, RF Module, EEPROM, Relay Coil, LED and Charge Contact from AC Adaptor (+6V) as shown in Fig.101. The power supply is as follows;

- DECT BBIC (IC2): CN2(+6V) → D1 → IC1 → Q2 → IC2
- RF Module (IC4): CN2(+6V) → D1 → IC1 → IC4
- EEPROM (IC3): CN2(+6V) → D1 → IC1 → Q2 → IC3
- Flash Memory (IC7): CN2(+6V) → D1 → IC1 → Q2 → IC7
- Charge Contact (TP11): CN2(+6V) → D1 → R4, R5 → TP11
- Flash Memory (IC6): CN2(+6V) → D1 → IC1 → Q2 → IC6

<Fig.101>



21.3. Telephone Line Interface

<Function>

- Bell signal detection
- Clip signal detection
- ON/OFF hook circuit
- Audio circuits

Bell & Clip (: Calling Line Identification Presentation: Caller ID) signal detection:
In the standby mode, Q4 is open to cut the DC loop current and decrease the ring load.
When ring voltage appears at the TP21 (A) and TP19 (B) leads (when the telephone rings), the signal is transferred as follows;

- A → C13 → R17 → R24 → IC2 Pin 119 (CID IN +)
- B → C12 → R16 → R32 → IC2 Pin 112 (CID IN -)

ON/OFF hook circuit:
In the standby mode, Q4 is open, and connected as to cut the DC loop current and to cut the voice signal. The unit is consequently in an on-hook condition.
When IC2 detects a ring signal or press the TALK Key onto the handset, Q5 turns on and then Q4 turns on, thus providing an off-hook condition (active DC current flow through the circuit) and the following signal flow is for the loop current.

- A → D3 → Q4 → R34 → Q8 → R45 → R46 → D3 → B [OFF HOOK]

21.4. Transmitter/Receiver

Base Unit and Handset mainly consist of RF Module and DECT BBIC.
Base Unit and Handset transmit/receive voice signal and data signal through the antenna on carrier frequency.

Signal Pass:
***Refer to SIGNAL ROUTE ().**

21.4.1. Transmitter Block

The voice signal input from the TEL LINE interface goes to RF Module (IC4) through DECT BBIC (IC2) as shown in BLOCK DIAGRAM (BASE UNIT) ()
The voice signal passes through the analog part of IC2 where it is amplified and converted to a digital audio stream signal. The burst switch controller processes this stream performing encryption and scrambling, adding the various other fields to produce the GAP (Generic Access Profile) standard DECT frame, assigning to a time slot and channel etc.
In IC4, the carrier frequency is changing, and frequency modulated RF signal is generated and amplified, and radiated from antenna. Handset detects the voice signal or data signal in the circuit same as the following explanation of Receiver Block.

21.4.2. Receiver Block

The signal of 19.2 MHz band (18.81792 MHz ~ 18.97344 MHz) which is input from antenna is input to IC4 as shown in BLOCK DIAGRAM (BASE UNIT) ().
In IC4, the signal of 19.2 MHz band is downconverted to 864 kHz signal and demoduleted, and goes to IC2 as GAP (Generic Access Profile) standard DECT frames. It passes through the decoding section burst switch controller where it separates out the frame information and performs de-encryption and de-scrambling as required. It then goes to the DSP section where it is turned back into analog audio. This is amplified by the analog front end, and goes to the TEL LINE Interface.

22. BLOCK DIAGRAM (HANDSET)

23. CIRCUIT OPERATION (HANDSET)

23.1. Outline

Handset consists of the following ICs as shown in BLOCK DIAGRAM (HANDSET) ().
- DECT BBIC (Base Band IC): IC1
- All data signals (forming/analyzing ACK or CMD signal)

- All interfaces (ex: Key, Detector Circuit, Charge, DC/DC Converter, EEPROM, LCD)
- RF Module: IC3
- PLL Oscillator
- Detector
- Compress/Expander
- Amplifier for transmission and reception
- AMP: IC2
- Single OP_AMP for SP
- MIDI (Musical Instrument Digital Interface): IC4
- 16-Tone 32-Poly PCM Sound Generator
- Port (LED direct driver with PWM)
- EEPROM: IC10
- Temporary operating parameters (for RF, etc.)

Refer to EEPROM LAYOUT (HANDSET) ().

23.2. Power Supply Circuit/Reset Circuit

Circuit Operation:
When power on the Handset, the voltage is as follows;
BATTERY(2.2 V ~ 2.6V: J1) → L1, D1, Q2 (1.8V) → Q3 (2.7V) → Q1 (4.0V)
The Reset signal generates IC1 (78) and 1.8V.

23.3. Charge Circuit

Circuit Operation:
When charging the handset on the Base Unit, the charge current is as follows;
DC+(5.5V ~ 6V) → D1 → R4, R5 → CHARGE+(Base) → CHARGE+(Handset) → L4 → Q4 → D7 → F1 → BATTERY+ ... Battery ... BATTERY- → R43 → GND → CHARGE-(Handset) → CHARGE-(Base) → GND → DC-(GND)
In this way, the BBIC on Handset detects the fact that the battery is charged.
The charge current is controlled by switching Q5 of Handset.
Refer to Fig.101 in Power Supply Circuit ().

23.4. Battery Low/Power Down Detector

Circuit Operation:
"Battery Low" and "Power Down" are detected by BBIC which check the voltage from battery.
The detected voltage is as follows;

- **Battery Low**

  Battery voltage: V(Batt) ≦ 2.3V ± 50mV

The BBIC detects this level and "" starts flashing.

- Power Down

Battery voltage: V(Batt) ≦ 2.2V ± 50mV

The BBIC detects this level and power down.

Refer to Adjustment (Handset) ().

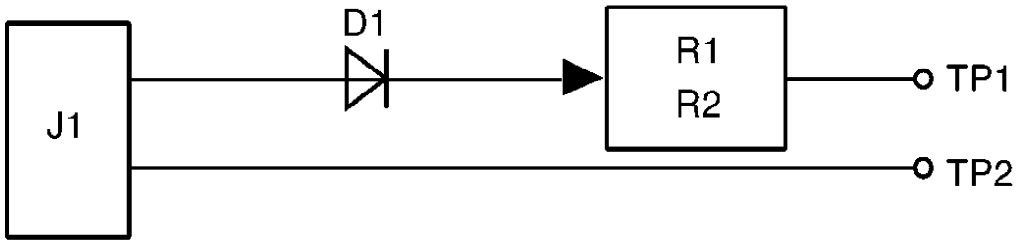
23.5. Speakerphone and Headset Jack

The hands-free loudspeaker at SP+ and SP- is used to generate the ring alarm. IC2 is used to switch off the telephone loudspeaker and is used to amplify the signal to drive the hands-free loudspeaker. They are selected using the SP_AMP line from pin 70 of the BBIC. 2.5mm headset jack is also available.

24. CIRCUIT OPERATION (CHARGER UNIT)

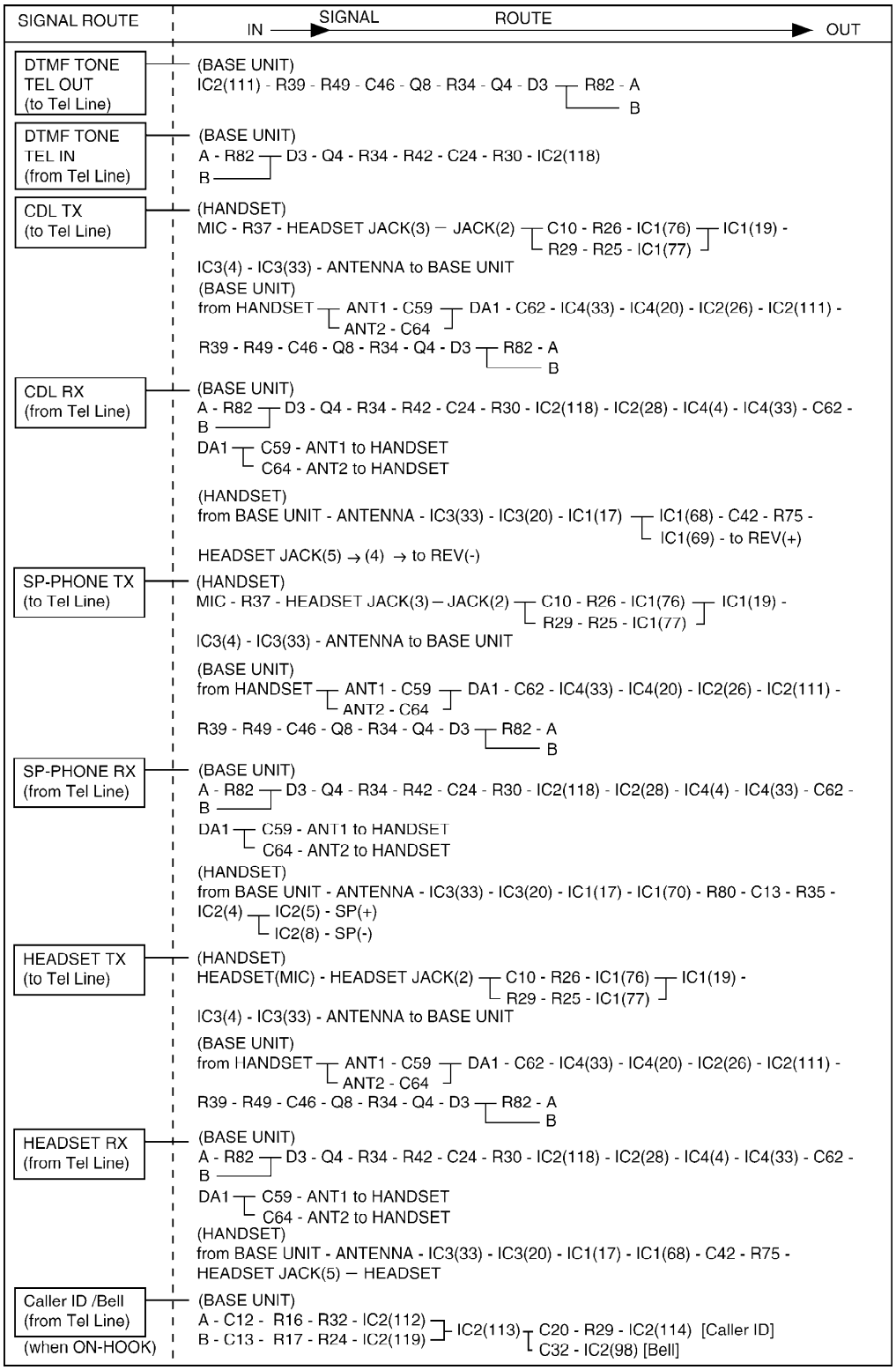
24.1. Power Supply Circuit

The power supply is as shown.



AC Adaptor

25. SIGNAL ROUTE


SIGNAL ROUTE
IN
SIGNAL
ROUTE
OUT
DTMF TONE TEL OUT (to Tel Line)
(BASE UNIT)
IC2(111) - R39 - R49 - C46 - Q8 - R34 - Q4 - D3 - R82 - A
B
DTMF TONE TEL IN (from Tel Line)
(BASE UNIT)
A - R82 - D3 - Q4 - R34 - R42 - C24 - R30 - IC2(118)
B
CDL TX (to Tel Line)
(HANDSET)
MIC - R37 - HEADSET JACK(3) — JACK(2) - C10 - R26 - IC1(76) - IC1(19) -
R29 - R25 - IC1(77)
IC3(4) - IC3(33) - ANTENNA to BASE UNIT
(BASE UNIT)
from HANDSET - ANT1 - C59 - DA1 - C62 - IC4(33) - IC4(20) - IC2(26) - IC2(111) -
ANT2 - C64
R39 - R49 - C46 - Q8 - R34 - Q4 - D3 - R82 - A
B
CDL RX (from Tel Line)
(BASE UNIT)
A - R82 - D3 - Q4 - R34 - R42 - C24 - R30 - IC2(118) - IC2(28) - IC4(4) - IC4(33) - C62 -
B
DA1 - C59 - ANT1 to HANDSET
C64 - ANT2 to HANDSET
(HANDSET)
from BASE UNIT - ANTENNA - IC3(33) - IC3(20) - IC1(17) - IC1(68) - C42 - R75 -
IC1(69) - to REV(+)
HEADSET JACK(5) → (4) → to REV(-)
SP-PHONE TX (to Tel Line)
(HANDSET)
MIC - R37 - HEADSET JACK(3) — JACK(2) - C10 - R26 - IC1(76) - IC1(19) -
R29 - R25 - IC1(77)
IC3(4) - IC3(33) - ANTENNA to BASE UNIT
(BASE UNIT)
from HANDSET - ANT1 - C59 - DA1 - C62 - IC4(33) - IC4(20) - IC2(26) - IC2(111) -
ANT2 - C64
R39 - R49 - C46 - Q8 - R34 - Q4 - D3 - R82 - A
B
SP-PHONE RX (from Tel Line)
(BASE UNIT)
A - R82 - D3 - Q4 - R34 - R42 - C24 - R30 - IC2(118) - IC2(28) - IC4(4) - IC4(33) - C62 -
B
DA1 - C59 - ANT1 to HANDSET
C64 - ANT2 to HANDSET
(HANDSET)
from BASE UNIT - ANTENNA - IC3(33) - IC3(20) - IC1(17) - IC1(70) - R80 - C13 - R35 -
IC2(4) - IC2(5) - SP(+)
IC2(8) - SP(-)
HEADSET TX (to Tel Line)
(HANDSET)
HEADSET(MIC) - HEADSET JACK(2) - C10 - R26 - IC1(76) - IC1(19) -
R29 - R25 - IC1(77)
IC3(4) - IC3(33) - ANTENNA to BASE UNIT
(BASE UNIT)
from HANDSET - ANT1 - C59 - DA1 - C62 - IC4(33) - IC4(20) - IC2(26) - IC2(111) -
ANT2 - C64
R39 - R49 - C46 - Q8 - R34 - Q4 - D3 - R82 - A
B
HEADSET RX (from Tel Line)
(BASE UNIT)
A - R82 - D3 - Q4 - R34 - R42 - C24 - R30 - IC2(118) - IC2(28) - IC4(4) - IC4(33) - C62 -
B
DA1 - C59 - ANT1 to HANDSET
C64 - ANT2 to HANDSET
(HANDSET)
from BASE UNIT - ANTENNA - IC3(33) - IC3(20) - IC1(17) - IC1(68) - C42 - R75 -
HEADSET JACK(5) — HEADSET
Caller ID /Bell (from Tel Line)
(when ON-HOOK)
(BASE UNIT)
A - C12 - R16 - R32 - IC2(112)
B - C13 - R17 - R24 - IC2(119)
IC2(113)
C20 - R29 - IC2(114) [Caller ID]
C32 - IC2(98) [Bell]

26. CPU DATA (BASE UNIT)

26.1. IC2 (BBIC)

Pin No	Description	I/O	Connection	at Normal mode	at Rese
1	VDDIO	-	-	-	-
2	VSS	-	-	-	-
3	AD8	D,O	AD7	O	O-
4	AD9	D,O	AD8	O	O-
5	AD10	D,O	AD9	O	O-
6	AD11	D,O	AD10	O	O-
7	AD12	D,O	AD11	O	O-
8	AD13	D,O	AD12	O	O-
9	AD14	D,O	AD13	O	O-
10	P3_7/PD7	D,O	NC	O	O-H
11	P3_1/PD1	D,O	NC	O	O-H
12	P3_5/PD5	D,O	ANT1	O	O-H
13	P3_4/PD4	D,O	ANT2	O	O-H
14	P3_3/PD3	D,O	PAON	O	O-H
15	P3_2/PD2	D,O	RXDSG	O	O-H
16	VDD	-	-	-	-
17	VSS	-	-	-	-
18	RFCLK	D,O	←	O	C
19	VDDRF	-	-	-	-
20	VSSRF	-	-	-	-
21	Xtal1	A,I	←	I	-
22	CAP	A,I	←	I	-
23	AVS	-	-	-	-
24	AVD	-	-	-	-
25	RSSI	A,I	RSSI	I	I
26	RDI	D,I	←	I	I
27	CMPREF	A,I	NC	OPEN	I
28	TDO	A,O	TXDA	A,O	Hi-
29	AD15	D,O	AD14	O	O-
30	AD16	D,O	AD15	O	O-
31	AD17	D,O	AD16	O	O-
32	AD18	D,O	AD17	O	O-
33	AD19	D,O	NC	O	O-
34	AD20	D,O	NC	O	O-
35	AD21	D,O	NC	O	O-
36	AD22	D,O	NC	O	O-
37	AD23	D,O	NC	O	O-
38	LE	D,O	←	D,O	C
39	SO	D,O	←	D,O	O-H
40	SK	D,O	←	D,O	C
41	DAC/ADC2	A,I	ADC2	I	I
42	P3_6/PD6	D,O	P3_6	O	O-H
43	RDN	D,O	RE	O	O-
44	WRN	D,O	WE	O	O-

Pin No	Description	I/O	Connection	at Normal mode	at Rese
45	MI/READY	D,O	NC	O	I-P
46	SCLK	D,O	NC	O	O-
47	UTX/P0_0	D,O	UTX	O	I
48	URX/P0_1	D,I	URX	I	I
49	JTIO/P0_2	D,I	JTAG	I	I
50	PCM_FSC1/P0_3	D,I/O	NC	O	I-P
51	PCM_FSC0/P0_4	D,I/O	NC	O	I-P
52	PCM_CLK/P0_5	D,I/O	NC	O	I-P
53	PCM_DOUT/P0_6	D,I/O	NC	O	I-P
54	PCM_DINP/P0_7	D,I/O	NC	O	I-P
55	VDDIO	-	-	-	-
56	VSS	-	-	-	-
57	INT0n/P1_0	D,I	INTOn	I	I-P
58	INT1n/P1_1	D,O	NC	O	I-P
59	INT2n/P1_2/ACS1	D,O	NC	O	I-P
60	ACS0	D,O	ACS0	O	O-
61	INT3n/P1_3/ACS2	D,O	NC	O	I-P
62	INT4n/P1_4	D,O	NC	O	I-P
63	VDDE/INT5n/P1_5	D,I	NC	I	C
64	BE1n	D,I/O	NC	O	O-
65	BE0n	D,I/O	NC	O	O-
66	SCL2/P3_0	D,O	SCL	O	C
67	SDA2	D,I	SDA	O	I
68	DAB0	D,I/O	DAB0	I/O	H
69	DAB8	D,I/O	DAB8	I/O	H
70	DAB1	D,I/O	DAB1	I/O	H
71	DAB9	D,I/O	DAB9	I/O	H
72	DAB2	D,I/O	DAB2	I/O	H
73	DAB10	D,I/O	DAB10	I/O	H
74	DAB3	D,I/O	DAB3	I/O	H
75	DAB11	D,I/O	DAB11	I/O	H
76	VSS	-	-	-	-
77	VDD	-	-	-	-
78	VDDIO	-	-	-	-
79	P2_0/PWM0/SPIDI	D,O	RNG_CNT	O	I
80	P2_1/PWM1/ SPICLK	D,O	LINE SEIZURE_CTRL	O	I
81	P2_2/ADC0/CLK100	D,O	ADC0	I	I
82	P2_3/ADC1	D,O	ADC1	I	I
83	P2_4/SCL1	D,O	HOOK_CNT	O	I
84	P2_5/SDA1	D,O	RLY_CNT	O	I
85	DAB4	D,I/O	DAB4	I/O	H
86	DAB12	D,I/O	DAB12	I/O	H
87	DAB5	D,I/O	DAB5	I/O	H

Pin No	Description	I/O	Connection	at Normal mode	at Rese
88	DAB13	D,I/O	DAB13	I/O	H
89	DAB6	D,I/O	DAB6	I/O	H
90	DAB14	D,I/O	DAB14	I/O	H
91	DAB7	D,I/O	DAB7	I/O	H
92	DAB15	D,I/O	DAB15	I/O	H
93	P2_7/DC_CTRL	D,O	NC	OPEN	O (fixed 1 dov
94	DC_I	A,I	NC	OPEN	I
95	P1_6/PON/INT6n	A,I	PON	I	I
96	P1_7/CHARGE/ INT7n	A,I	←	-	I (fixed 1 dov
97	P2_6/stop_charge	A,O	NC	OPEN	O
98	VBAT3/RINGING	A,I	RINGING	I	I
99	DC_stab	A,O	NC	OPEN	O
100	DC_Sense	A,I	NC	-	I
101	AVS_sense	A,I	NC	-	I
102	ADC3	A,I	NC	I	I
103	LDO1_sense	A,I	←	I	I
104	LDO1_CTRL	A,O	←	O	O
105	LDO2_CTRL	A,O	←	O	O
106	VBAT2	A,I	←	I	I
107	VBAT1	A,I	←	I	I
108	AVS2	-	-	-	-
109	AVD2	-	-	-	-
110	LSR+/REF	A,O	REF	O	O
111	LSR-/REF	A,O	SOUWA	O	O
112	LSR_HS/CIDIN-	A,I	CIDIN-	O	O
113	VREF_HS/CIDOUT	A,O	CIDOUT+	O	O
114	MIC-	A,I	←	I	I
115	VREF-	A,O	←	O	O
116	VBUF	A,O	NC	OPEN	O
117	AGND	A,O	←	O	O
118	MIC+	A,I	←	I	I
119	VREF+/CIDIN+	A,I	CIDIN-	I	I
120	RSTN	A,I	←	I	I
121	AD0	D,O	NC	I	O-
122	AD1	D,O	AD0	O	O-
123	AD2	D,O	AD1	O	O-
124	AD3	D,O	AD2	O	O-
125	AD4	D,O	AD3	O	O-
126	AD5	D,O	AD4	O	O-
127	AD6	D,O	AD5	O	O-
128	AD7	D,O	AD6	O	O-

27. CPU DATA (HANDSET)

27.1. IC1 (BBIC)

Pin No	Description	I/O	Connection	at Normal mode	at Rese
1	P3_7/PD7	D,O	LCD_A0	O	C
2	P3_1/PD1	D,O	RXDSG	O	C
3	P3_5/PD5	D,O	SPAMP CD	O	C
4	P3_4/PD4	D,I/O	MIDI ERQ	I	C
5	P3_3/PD3	D,O	PAON	O	C
6	P3_2/PD2	D,O	PSEL	O	C
7	VDD	-	-	-	-
8	VSS	-	-	-	-
9	RFCLK	D,O	SYRI	O	C
10	VDDRF	-	-	-	-
11	VSSRF	-	-	-	-
12	Xtal1	A,I	←	I	C
13	CAP	A,I	←	I	C
14	AVS	-	-	-	-
15	AVD	-	-	-	-
16	RSSI	A,I	RSSI	I	C
17	RDI	D,I	RXDA	I	C
18	CMPREF	A,I	NC	OPEN	C
19	TDO	A,O	TXDA	A,O	C
20	LE	D,O	SYEN	D,O	C
21	SO	D,O	SYDA	D,O	C
22	SK	D,O	SYCL	D,O	C
23	DAC/ADC2	D,I	JACK DETECTION	I	C
24	P3_6/PD6	D,I/O	MIDI_SRQ	I	C
25	UTX/P0_0	D,O	UTX	O	C
26	URX/P0_1	D,I	URX	I	C
27	JTIO/P0_2	D,I	JTAG	I	C
28	PCM_FSC1/P0_3	D,I	COL1	I	C
29	PCM_FSC0/P0_4	D,I	COL2	I	C
30	PCM_CLK/P0_5	D,I	COL3	I	C
31	PCM_DOUT/P0_6	D,I	COL4	I	C
32	PCM_DIN/P0_7	D,I	COL5	I	C
33	VDDIO	-	-	-	-
34	VSS	-	-	-	-
35	INT0n/P1_0	D,O	ROW0	O	C
36	INT1n/P1_1	D,O	ROW1	O	C
37	INT2n/P1_2	D,O	ROW2	O	C
38	INT3n/P1_3	D,O	ROW3	O	C
39	INT4n/P1_4	D,I	MIDI_IRQ	I	C

Pin No	Description	I/O	Connection	at Normal mode	at Rese
40	VDDE/INT5n/P1_5	D,O	COL0	O	-
41	SCL2/P3_0	D,O	SCL	O	C
42	SDA2	D,I/O	SDA	I/O	C
43	VSS	-	-	-	-
44	VDD	-	-	-	-
45	P2_0/PWM0	D,O	PWM0	O	C
46	P2_1/PWM1	D,O	CS2	O	C
47	P2_2/ADC0	D,O	EX_RESET	O	C
48	P2_3/ADC1	D,O	MIDI-CS	O	C
49	P2_4/SCL1	D,O	LCD-SCLK MIDI_SCLK	O	C
50	P2_5/SDA1	D,O	LCD-SCLK MIDI_SCLK	O	C
51	P2_7/DC_CTRL	D,O	DC_CTRL	O	C
52	DC_I	A,I	←	I	C
53	P1_6/PON/INT6n	A,I	PON	I	C
54	P1_7/CHARGE/ INT7n	A,I	CHARGE	I	C
55	P2_6/stop_charge	A,O	STOP-CHARGE	O	C
56	VBAT3/RINGING	A,I	VBAT3	I	C
57	DC_stab	A,O	←	O	C
58	DC_Sense	A,I	←	I	C
59	AVS_sense	A,I	←	I	C
60	ADC3	A,I	←	I	C
61	LDO1_sense	A,I	←	I	C
62	LDO1_CTRL	A,O	←	O	C
63	LDO2_CTRL	A,O	←	O	C
64	VBAT2	A,I	←	I	C
65	VBAT1	A,I	←	I	C
66	AVS2	-	-	-	-
67	AVD2	-	-	-	-
68	LSR+/REF	A,O	LSR+	O	C
69	LSR-/REF	A,O	LSR-	O	C
70	LSR_HS/CIDIN-	A,O	LSR_HS	O	C
71	VREF_HS/CIDOUT	A,O	NC	OPEN	-
72	MIC-	A,I	←	I	C
73	VREF-	A,O	←	O	C
74	VBUF	A,O	←	O	C
75	AGND	A,O	←	O	C
76	MIC+	A,I	←	I	C
77	VREF+/CIDIN+	A,O	VREF+	O	C
78	RSTN	D,I	←	I	C
79	VDDIO	-	-	-	-

Pin No	Description	I/O	Connection	at Normal mode	at Rese
80	VSS	-	-	-	-

Note:
JACK DETECTION; Detect if a Headset is inserted into the JACK or not. Without a Headset, 1.5V is measured at pin 23, while with a Headset, 0V is measured at pin 23.

28. EEPROM LAYOUT (BASE UNIT)

28.1. Scope

The purpose of this section is to describe the layout of the EEPROM (IC3) for the KX-TCD510 Base Unit.
The EEPROM contains hardware, software, and user specific parameters. Some parameters are set during production of the base e.g. crystal frequency adjustment at address 0286, some are set by the user configuration e.g. ringer volume at address 02C5, and some are set during normal use of the phone e.g. Caller ID data at address 096A..0FDB.

28.2. Introduction

The base unit uses a 32K bit serial EEPROM (IC3) for storing volatile parameters. All parameters are set up before the base leaves the factory. Some of these are vital for the operation of the hardware so a set of default parameters is programmed before the actual hardware fine-tuning can be initiated. This document lists all default settings with a short description.
In the tables below values in a range that are similar are not repeated; i.e. Address 00 to 01 contains the value 00 simply means that the value 00 is repeated in all addresses in the range.
All values in this document are in hexadecimal notation.

Initial Type	Description
F	The data initialized by only F command
0	The data initialized by F and 0 command
1	The data initialized by F, 0 and 1 command
2	The data initialized by all command (F,0,1,2)

Country Setting	Description
x	Default - no specific country setting, so revert to default value.

28.3. EEPROM Layout

28.3.1. General Setup1

Address	Initial Type	Name	Description	Default value
0	-	EEP_EepromType	EEPROM type 0x00:32kbit type TCD500/510 0x55:64kbit type TCD530/540 0xAA:128kbit type TCD505/515/535/545 other:32kbit type	0x00
1	F	EEP_ModelInfo	Model information Bit0:TAM 1:Enable 0:Disable Bit1:Base Phonebook 1...1:Enable, 0:Disable Bit2:Audible Call...1:Enable, 0:Disable Bit3:SP-PHONE...1:Enable, 0:Disable Bit4-7:Not used TCD500/505: 0x00 TCD510/515: 0x07 TCD530/535: 0x0A TCD540/545: 0x0F	0x00
245	1	EEP_MenusEnabled	Menus Enabled Bit0= Menu of Select Dial Mode 1:Enable 0: Disable Bit1=Flash Type1 Menu...1:Enable, 0:Disable Bit2=Flash Type2 Menu...1:Enable, 0:Disable Bit3=Flash Type3 Menu...1:Enable, 0:Disable Bit4=Menu of Select Pause time...1:Enable, 0 :Disable	0x1E

28.3.2. General Setup2

Address	Initial Type	Name	Description	Default value
280	F	EEP_Rfpi	Base ID written data by adjustment checker or ID writer RFPI (5Byte)	0xFF,0xFF,0xFF,0xF
286	F	EEP_FreqTrim_L	Setting value of FREQ_TRM_RE	0x75
287	F	EEP_BandGap	Setting value of BandGap REG	0x08
288	F	EEP_Rc0	BMC internal Register 0	0x10
29B	1	EEP_RxAtteCrcErrorRsc	Attenuation parameter Crc Error Rsc	0x43
395	0	EEP_Ps0_InUseFlag	IN-Use Flag 00:Invalid / 01:Valid	0x00
396	0	EEP_Ps0_DectPsNo	DECT PS No. 00-3F:PS No. / FF:Invalid	0xFF
397	0	EEP_Ps0_PsType	PS Type 00:KME's PS (Group Page) 01:KME's PS (Group Page/Message Waiting) 02:TD-7500 or TD-7590 / FF:Another Maker's PS	0xFF
398	0	EEP_Ps0_Ipui	PS ID first byte:0xA8 (Length Infomation) from second byte:IPUI (Normal:5byte Max.13byte)	0x00,0x00,0x00,0 0x00,0x00,0x00,0 0x00,0x00,0x00,0 0x00
3DD	0	EEP_Ps1_InUseFlag	IN-Use Flag 00:Invalid / 01:Valid	0x00
3DE	0	EEP_Ps1_DectPsNo	DECT PS No. 00-3F:PS No. / FF:Invalid	0xFF
3DF	0	EEP_Ps1_PsType	PS Type 00:KME's PS (Group Page) / 01:KME's PS (Group Page/Message Waiting) 02:TD-7500 or TD-7590 / FF:Another Maker's PS	0xFF
3E0	0	EEP_Ps1_Ipui	PS ID IPUI (14Byte)	0x00,0x00,0x00,0 0x00,0x00,0x00,0 0x00,0x00,0x00,0 0x00
425	0	EEP_Ps2_InUseFlag	IN-Use Flag 00:Invalid / 01:Valid	0x00

Address	Initial Type	Name	Description	Default value
426	0	EEP_Ps2_DectPsNo	DECT PS No. 00-3F:PS No. / FF:Invalid	0xFF
427	0	EEP_Ps2_PsType	PS Type 00:KME's PS (Group Page) / 01:KME's PS (Group Page/Message Waiting) 02:TD-7500 or TD-7590 / FF:Another Maker's PS	0xFF
428	0	EEP_Ps2_Ipui	PS ID IPUI (14Byte)	0x00,0x00,0x00,0 0x00,0x00,0x00,0 0x00,0x00,0x00,0 0x00
46D	0	EEP_Ps3_InUseFlag	IN-Use Flag 00:Invalid / 01:Valid	0x00
46E	0	EEP_Ps3_DectPsNo	DECT PS No. 00-3F:PS No. / FF:Invalid	0xFF
46F	0	EEP_Ps3_PsType	PS Type 00:KME's PS (Group Page) / 01:KME's PS (Group Page/Message Waiting) 02:TD-7500 or TD-7590 / FF:Another Maker's PS	0xFF
470	0	EEP_Ps3_Ipui	PS ID IPUI (14Byte)	0x00,0x00,0x00,0 0x00,0x00,0x00,0 0x00,0x00,0x00,0 0x00
4B5	0	EEP_Ps4_InUseFlag	IN-Use Flag 00:Invalid / 01:Valid	0x00
4B6	0	EEP_Ps4_DectPsNo	DECT PS No. 00-3F:PS No. / FF:Invalid	0xFF
4B7	0	EEP_Ps4_PsType	PS Type 00:KME's PS (Group Page) / 01:KME's PS (Group Page/Message Waiting 02:TD-7500 or TD-7590 / FF:Another Maker's PS	0xFF

Address	Initial Type	Name	Description	Default value
4B8	0	EEP_Ps4_Ipui	PS ID IPUI (14Byte)	0x00,0x00,0x00,0 0x00,0x00,0x00,0 0x00,0x00,0x00,0 0x00
4FD	0	EEP_Ps5_InUseFlag	IN-Use Flag 00:Invalid / 01:Valid	0x00
4FE	0	EEP_Ps5_DectPsNo	DECT PS No. 00-3F:PS No. / FF:Invalid	0xFF
4FF	0	EEP_Ps5_PsType	PS Type 00:KME's PS (Group Page) / 01:KME's PS (Group Page/Message Waiting 02:TD-7500 or TD-7590 / FF:Another Maker's PS	0xFF

28.3.3. Flash Time Setting

Address	Initial Type	Name	Description	Default value
E	1	FlashTime1	Calibrated loop-break time for short break Unit : 10 ms, defaults to 700 ms	0x46
F	1	FlashTime2	Calibrated loop-break time for long break Unit : 10 ms, defaults to 80 ms	0x08
10	1	FlashTime3	Calibrated loop-break time for extra-long break Unit : 10 ms, defaults to 400 ms	0x28

28.3.4. Clip (Caller ID) configuration

Address	Initial Type	Name	Description	Default value
59	1	EEP_ClipDetectConfig	CLIP detect configuration Bit0-2:Mode...0:Learn mode, 1:DTMF only, 2: FSK only, 3:FSK/DTMF both, 4:Russian CLIP only Bit3:Unused3 Bit4:Onhook...1=enable, 0=disable Bit5:Offhook...1=enable, 0=disable Bit6:MsgWaiting...1=enable, 0=disable Bit7:Unused7	0x73
5A	1	EEP_ClipRingConfig	Ring configuration Bit0:Rpas...1=enable, 0=disable Bit1:RpasAlert...1=enable, 0=disable Bit2:Rpas2LongAlert...1=enable, 0=disable Bit3:Suppress1stRing...1=enable, 0=disable Bit4-7:Unused	0x00
5B	1	EEP_ImpSetConfig	Impedance Set configuration Bit0:Polarity...1=enable, 0=disable Bit1:Dtas...1=enable, 0=disable Bit2:Rpas...1=enable, 0=disable Bit3:PowerRing...1=enable, 0=disable Bit4:LearnImpPattern...1=enable, 0=disable Bit5:CheckPolStatus...1=enable, 0=disable Bit6-7: Unused	0x15
5C	1	EEP_ImpRemConfig	Impedance Remove configuration Bit0:Polarity...1=enable, 0=disable Bit1:Ringing...1=enable, 0=disable Bit2:ClipReceived...1=enable, 0=disable Bit3:Offhook...1=enable, 0=disable Bit4:ChszDet...1=enable, 0=disable Bit5-7:Unused	0x0F
5D	1	EEP_CasAckDtmf	CAS Acknowledge DTMF tone 00:DTMF 0 - 09:DTMF 9 0A:DTMF A 0B:DTMF B 0C:DTMF C 0D:DTMF D 0E:DTMF * 0F:DTMF #	0x0D
5E	1	EEP_DtmfReceiveDataCount	Valid Receive data Count (for INDIA)	0x04

Address	Initial Type	Name	Description	Default value
5F	1	EEP_ClipPhaseConfig	CLIP phase set configuration Bit0:ForwardNumber...1=enable, 0=disable Bit1:CallingNumber...1=enable, 0=disable Bit2:Dutch...1=enable, 0=disable Bit3:Canadian...1=enable, 0=disable Bit4:KpnVmwi...1=enable, 0=disable Bit5:PriorityCheck...1=enable, 0=disable Bit6-7:AddZero...0:no add zero, 1:add zero absolutely 2:Check Number's top is zero. If it is zero, add zero.	0x04
60	1	EEP_ClipPhaseConfig2	CLIP phase set configuration Bit0:FskRemoveParity...1=enable, 0=disable Bit1:AutoRappel...1=enable, 0=disable Bit2:KpnStartEndNg Bit3-7:Unused	0x01
61	1	EEP_AddZeroDataCount	Valid data for Add Zero (for NewZealand)	0x05
62	1	EEP_RingVmwiConfig	CLIP RingVmwi set configuration Bit0:LongBellFuncOff...1=enable, 0=disable Bit1:StatusSucceed...1=enable, 0=disable Bit2-7:Unused	0x01
63	1	EEP_RpasMinDuration	RPAS minimum duration Unit : 10ms, Default : 180ms	0x12
64	1	EEP_RpasMaxDuration	RPAS maximum duration Unit : 10ms, Default : 320ms	0x20
65	1	EEP_DtasMinDuration	DTAS minimum duration Unit : 10ms, Default : 60ms	0x06
66	1	EEP_DtasMaxDuration	DTAS maximum duration Unit : 10ms, Default : 130ms	0x0D
67	1	EEP_DtasDataTimeout	DTAS to FSK data timeout Unit : 100ms, Default : 1s	0x0A
68	1	EEP_ImpSetTimeout	Impedance Set timeout (RPAS for France) Unit : 10ms, Default : 250ms [Standard : 200-350ms]	0x14
69	1	EEP_ImpRemRpasTimeout	Impedance Remove timeout (RPAS) Unit : 10ms, Default : 1250ms [Standard : 1450ms (subtract Impedance Set timeout)]	0x7D
6A	1	EEP_ImpRemChszTimeout	Impedance Remove timeout (Channel Seizure) Unit : 10ms, Default : 450ms [Standard : 420-570ms]	0x2D

Address	Initial Type	Name	Description	Default value
6B	1	EEP_ImpRemContTimeout	Impedance Remove timeout Unit : 100ms, Default : 1s	0x0A
6C	1	EEP_CasMinDuration	CAS minimum duration Unit : 10ms, Default : 60ms	0x06
6D	1	EEP_CasMaxDuration	CAS maximum duration Unit : 10ms, Default : 130ms	0x0D
6E	1	EEP_CasAckDelayTimeout	CAS to Acknowledge DTMF Delay Timeout Unit : 1ms, Default : 0ms	0x00
6F	1	EEP_CasAckDuration	Acknowledge DTMF tone duration Unit : 1ms, Default : 70ms	0x46
70	1	EEP_CasAckDataTimeout	CAS to FSK data timeout Unit : 10ms, Default : 600ms	0x3C
71	1	EEP_FskInterdigitTimeout	FSK Interdigit timeout Unit : 10ms, Defalut : 80ms	0x08
72	1	EEP_FskMarkoutTimeout	FSK Markout timeout after FSK received Unit : 10ms, Default : 100ms	0x0A
73	1	EEP_DtmfMinDuration	DTMF minimum duration Unit : 10ms, Default : 20ms	0x02
74	1	EEP_DtmfMaxDuration	DTMF maximum duration Unit : 10ms, Default : disable(0xFF)	0xFF
75	1	EEP_DtmfInterdigitTimeout	DTMF Interdigit timeout Unit : 10ms, Default : 500ms	0x32
76	1	EEP_DtmfMuteTimeout	Mute timeout when OFFHOOK CLIP received (for DK) Unit : 100ms, Default : 5s	0x32
77	1	EEP_DtmfBellWaitTimeout	Bell Wait timeout Unit : 100ms, Default : 10s	0x64
78	1	EEP_RingVmwiMinDuration	Bell Ring minimum duration (for KPN VoiceMail) Unit : 1s, Default : 14s	0x0E
79	1	EEP_RingVmwiMaxDuration	Bell Ring maximum duration (for KPN VoiceMail) Unit : 1s, Default : 22s	0x16
7A	1	EEP_RingPulseMin	Bell Ring on minimum duration (for KPN VoiceMail) Unit : 10ms, Default: 600ms	0x3C
7B	1	EEP_VmwiRingInterdigitMax	Bell Ring Interdigit maximum (for KPN VoiceMail) Unit : 100ms, Default: 5000ms	0x32
7C	1	EEP_RuDtmfDurationMin	RU_DTMF minimum duration Unit : 10ms, Default : 10ms	0x01

Address	Initial Type	Name	Description	Default value
7D	1	EEP_RuDtmfDurationMax	RU_DTMF maximaum duration Unit : 10ms, Default : 70ms	0x07
7E	1	EEP_RuDtmfDurationOff	RU_DTMF Off duration Unit : 10ms, Default : 50ms	0x05
7F	1	EEP_RuConfig	Russian CLIP Configuration Bit0:Unused Bit1:RuClipMode...1=Auto, 0=Manual Bit2:RuClipRbtOnOff...1=on, 0=off Bit3-7:Unused	0x00
80	1	EEP_RuClipReqLength	Length of REQ signal Unit : 10ms, Default : 140ms	0x0E
81	1	EEP_RuClipDelayBetweenReq	Delay between REQ signal Unit : 10ms, Default : 200ms	0x14
82	1	EEP_RuClipBackTraceTimeout	Back Trace Start Timeout Unit : 10ms, Default : 600ms	0x3C
83	1	EEP_RuClipRepeatReq	Number of repeat REQ request Sent Default : 3 repeat	0x03
84	1	EEP_RuClipDelayBeforeReq	Delay before Send REQ signal Unit : 10ms, Default : 200ms	0x14
85	1	EEP_RuRcvDigitBeforeReq	Receive Digit Before REQ Default : 2digit	0x02
86	1	EEP_PseudoBellLength	Pseudo Bell Length Unit : 10ms, Default : 800ms	0x50
87	1	EEP_PseudoBellInterdigitTimeout	Pseudo Bell Interdigit Timeout Unit : 100ms, Default : 3200ms	0x20
88	1	EEP_PseudoBellEndTimeout	Pseudo Bell End Timeout Unit : 1s, Default : 30s	0x1E
89	1	EEP_RuClipReqLev	RCID REQ signal Level Default : -4.3dBm	0x00, 0x19
26D	2	EEP_RuClipOnOff	Russian CLIP On/Off	0x01
26E	2	EEP_RuClipRingNumBeforeSequence	Number Of Rings Patterns Before Start Sequence Default : 1	0x01
26F	2	EEP_RuClipDisplayDigit	Number Of digits to be displayed Default:7 digits	0x07

29. EEPROM LAYOUT (HANDSET)

29.1. Scope

The purpose of this section is to describe “layout of the EEPROM (IC10) KX-TCA151 Handset”. The EEPROM contains hardware, software, and user specific parameters. Some parameters are

set during production of the handset e.g. crystal oscillator adjustment at 0057, some are set by the user when configuring the handset e.g. ringer volume at 00A1, and some during normal use of the phone e.g. redial memory at 1EF6..1F77.

29.2. Introduction

The handset uses a 64k bit serial EEPROM (IC10) for storing volatile parameters. All parameters are set up before the handset the factory. Some of these are vital for the operation of the hardware so a set of default parameters is programmed before the actual hardware fine-tuning can be initiated. This document lists all default settings with a short description.
This document lists all default parameters with a short description.
In the tables below values in a range that are similar are not repeated; i.e. Address 00 to 01 contains the value 00 simply means that the value 00 is repeated in all addresses in the range.

Initial Type	Description
F	The data initialized by only F command
0	The data initialized by F and 0 command
1	The data initialized by F, 0 and 1 command
2	The data initialized by all command (F,0,1,2)

Country Setting	Description
x	Default - no specific country setting, so revert to default value.

29.3. EEPROM contents

29.3.1. General Setup

Address	Initial Type	Name	Description	Default valu
52	F	EEP_Ipei	International Portable Part Equipment Identities. A concatenation of an EMC and a unique 20 bit Serial Number.	0x00,0x00,0x00 0x00
57	F	EEP_FreqTrim_L	Setting value of FREQ_TRIM_REG	0x75
58	F	EEP_BandGap	Setting value of BandGap REG	0x08
6B	1	EEP_LowQualityLevel	Signal quality level at which handover is initiated (CRC error count).	10
74	1	EEP_RxMuteSyncError	Continuous SYNC error times for the Rx Mute (0-0xFF:Error times)	10
131	0	EEP_HandsetNumber	HandsetNumber each Subscription (wordx4subs)	0xFF,0xFF,0xFF,0xFF0xFF
139	0	EEP_Subscription0	GAP Subscription Data. Storage for 4 subscriptions each with 53bytes. <Subscription> 12E : SUB_boAssignedIPUI 12F : SUB_abIPUI[14] 13D : SUB_abPARK[5] 142 : SUB_abSARI[4] 146 : SUB_bPLI 147 : SUB_bLAL 148 : SUB_abARIplusRPN[5] 14D : SUB_boZAP 14E : SUB_bZAP 14F : SUB_boServiceClass 150 : SUB_bServiceClass 151 : AK_boUAKavailable 152 : AK_boUAKproven 153 : AK_boUAK_or_AC [16]	All 0x00
1EBE	2	EEP_HSPinCode	Handset Pin : 4 BCD Digits	0x00, 0x00

29.3.2. MMI Setting

Address	Initial Type	Name	Description	Default valu
82	1	EEP_FactoryLanguageSetting	Selected Language for LCD GERAM:0 ENGLISH:1 SPANISH:2 NORWEGIAN:3 FRENCH:4 ITALIAN:5 DENISH:6 DUTCH:7 SWEDISH:8 FINNISH:9 GREEK:10 TURKISH:11 HUNGARIAN:12 PORTUGUESE:13 RUSSIAN:14 POLISH:15 SLOVAKIAN:16 CZECH:17 CROATIAN:18 CATALAN:19	0x01
83	1	EEP_Available_Language	Select Available Language 0:Disable 1:Enable	0xFF,0xBF,0x
1EEF	2	EEP_Language	User_Setting Language GERAM:0 ENGLISH:1 SPANISH:2 NORWEGIAN:3 FRENCH:4 ITALIAN:5 DENISH:6 DUTCH:7 SWEDISH:8 FINNISH:9 GREEK:10 TURKISH:11 HUNGARIAN:12 PORTUGUESE:13 RUSSIAN:14 POLISH:15 SLOVAKIAN:16 CZECH:17 CROATIAN:18 CATALAN:19	0x01
1EF0	2	EEP_SmsEatoniLanguage	Eatoni Setting Language GERAM:0 ENGLISH:1 SPANISH:2 NORWEGIAN:3 FRENCH:4 ITALIAN:5 DENISH:6 DUTCH:7 SWEDISH:8 FINNISH:9 GREEK:10 TURKISH:11 HUNGARIAN:12 PORTUGUESE:13 RUSSIAN:14 POLISH:15 SLOVAKIAN:16 CZECH:17 CROATIAN:18 CATALAN:19	0x01

Address	Initial Type	Name	Description	Default valu
1FED	1	EEP_CountryFunction	Country parameter 0bit: Reset Ear-SP Vol. after Talk...0: Hold, 1: Disable 1bit: PBX Phone-Book...0: Hold, 1: Disable 2-7bit: Reserve	0x02

29.3.3. MMI1 Setting

Address	Initial Type	Name	Description	Default valu
2	1	EEP_DspSdt2Level	DSP Parameter SideTone2 Main:SideTone2 Main route level MictoRcv:SideTone2 MIc to Receiver level	0xFF,0x7F,0x00,
6	1	EEP_DspToneLevel	DSP Parameter ToneLevel Talk:Tone Level in Talk mode Spp:Tone Level in Spp mode	0xFF,0x7F,0xFF,
A	1	EEP_DspRxMuteLevel	DSP Parameter RxMute Level Talk:RxMute Level in Talk mode Spp:RxMute Level in Spp mode	0xFF,0x7F,0xFF,
E	1	EEP_DspRcvVol	DSP Parameter Receiver Volume TX Level TxTalk:Receiver Volume Tx Level in Talk mode TxSpp:Receiver Volume Tx Level in Spp mode	0xFF,0x7F,0xFF,
39	1	EEP_LcdContrast	LCD contrast	0x1E
4B	1	EEP_CountryFunction01	Country parameter Bit0: Call waiting Tone on/off ...1:on, 0:off Bit1-7: Reserve	0x01
4C	2	EEP_EEToneConfig	Tone Option Data Bit 0:Keytone on/off00 - 0000 = Off / 0001 = Tone On Bit 1:Keytone on/off01 - Reserve Bit 2:Keytone on/off02 - Reserve Bit 3:Keytone on/off03 - Reserve Bit 4:Call waiting on/off - 1/0 Bit 5:Range alarm on/off - 1/0 Bit 6:Battery low alarm on/off - 1/0	0x51

29.3.4. Battery Paramters

Address	Initial Type	Name	Description	Default valu
1	F	EEP_LowVoltage	Number of ADC step for battery low	0x30
36	F	EEP_NoVoltage	Number of ADC step for batter empty	0x22

30. HOW TO REPLACE FLAT PACKAGE IC

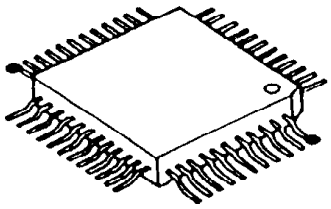
30.1. Preparation

- PbF (: Pb free) Solder
- Soldering Iron
  Tip Temperature of 700°F ± 20°F (370°C ± 10°C)
  Note: We recommend a 30 to 40 Watt soldering iron. An expert may be able to use a 60 to 80 Watt iron where someone with less experience could overheat and damage the PCB foil.
- Flux
  Recommended Flux: Specific Gravity →0.82.
  Type →RMA (lower residue, non-cleaning type)

Note: See ABOUT LEAD FREE SOLDER (PbF: Pb free) ().

30.2. Procedure

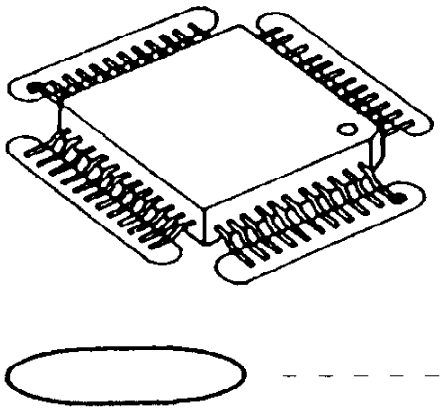
1. Tack the flat pack IC to the PCB by temporarily soldering two diagonally opposite pins in the correct positions on the PCB.



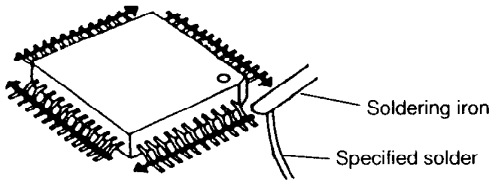
●- - - - - -Temporary soldering point.

Be certain each pin is located over the correct pad on the PCB.

2. Apply flux to all of the pins on the IC.

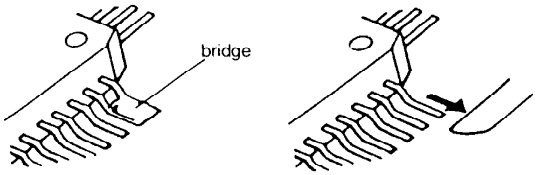


3. **Being careful to not unsolder the tack points, slide the soldering iron along the tips of the pins while feeding enough solder to the tip so that it flows under the pins as they are heated.**

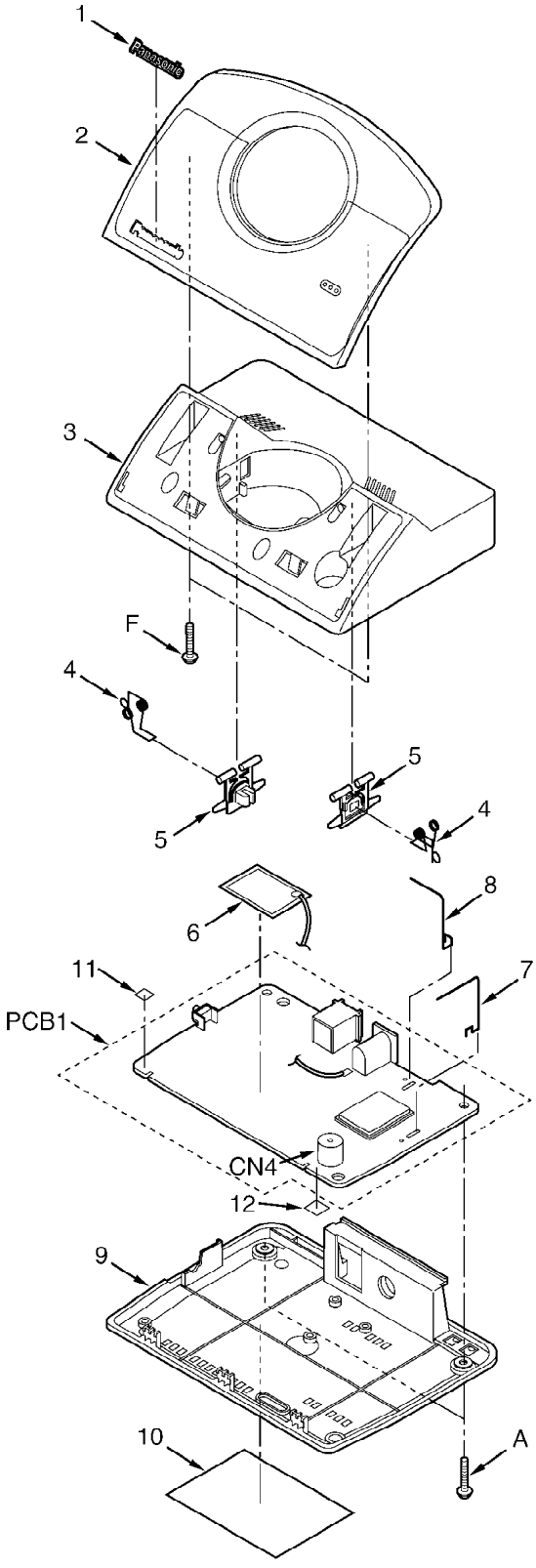


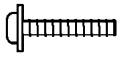
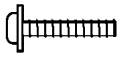
30.3. Modification Procedure of Bridge

1. **Add a small amount of solder to the bridged pins.**
2. **With a hot iron, use a sweeping motion along the flat part of the pin to draw the solder from between the adjacent pads.**

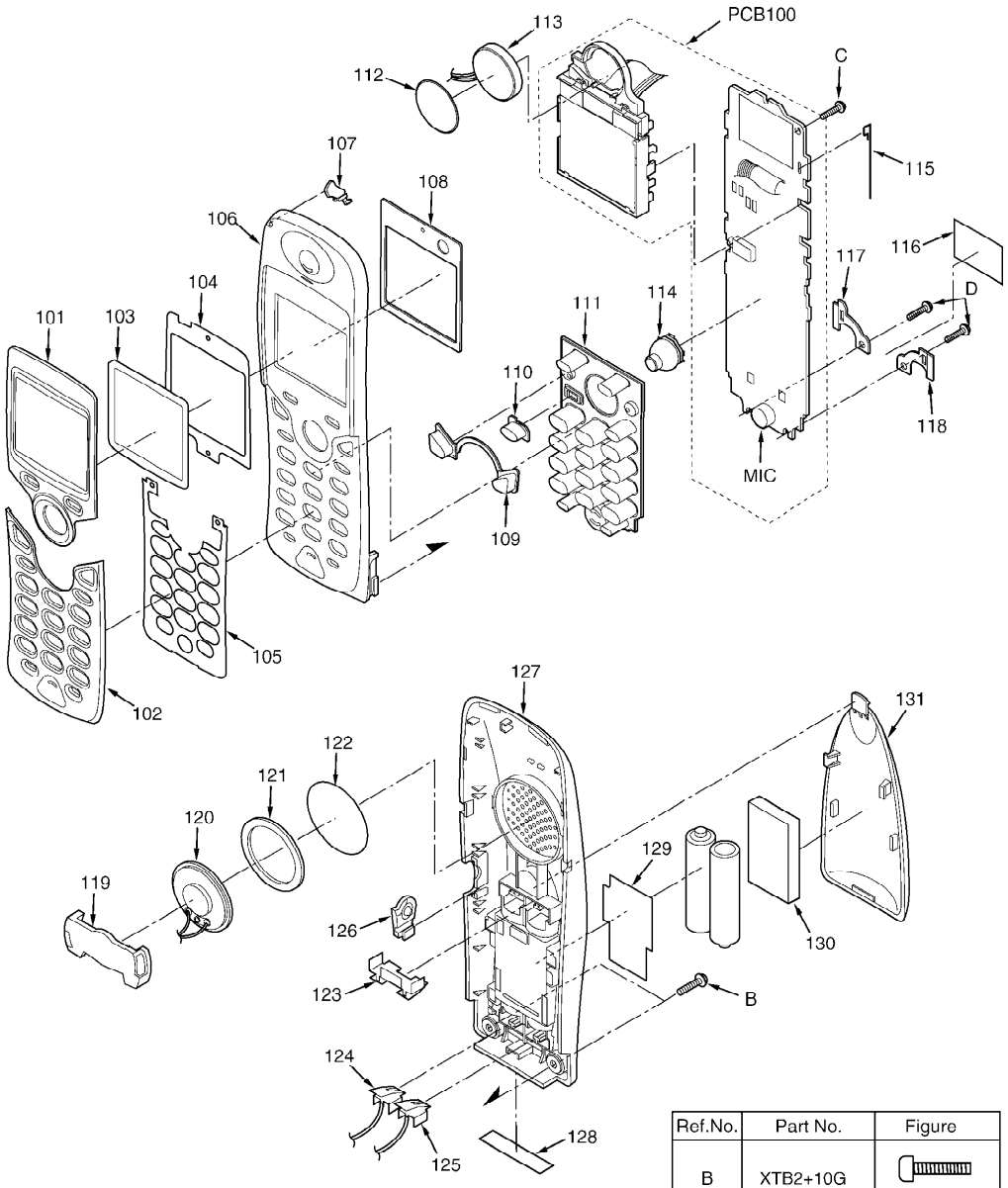


31. CABINET AND ELECTRICAL PARTS LOCATION (BASE UNIT)



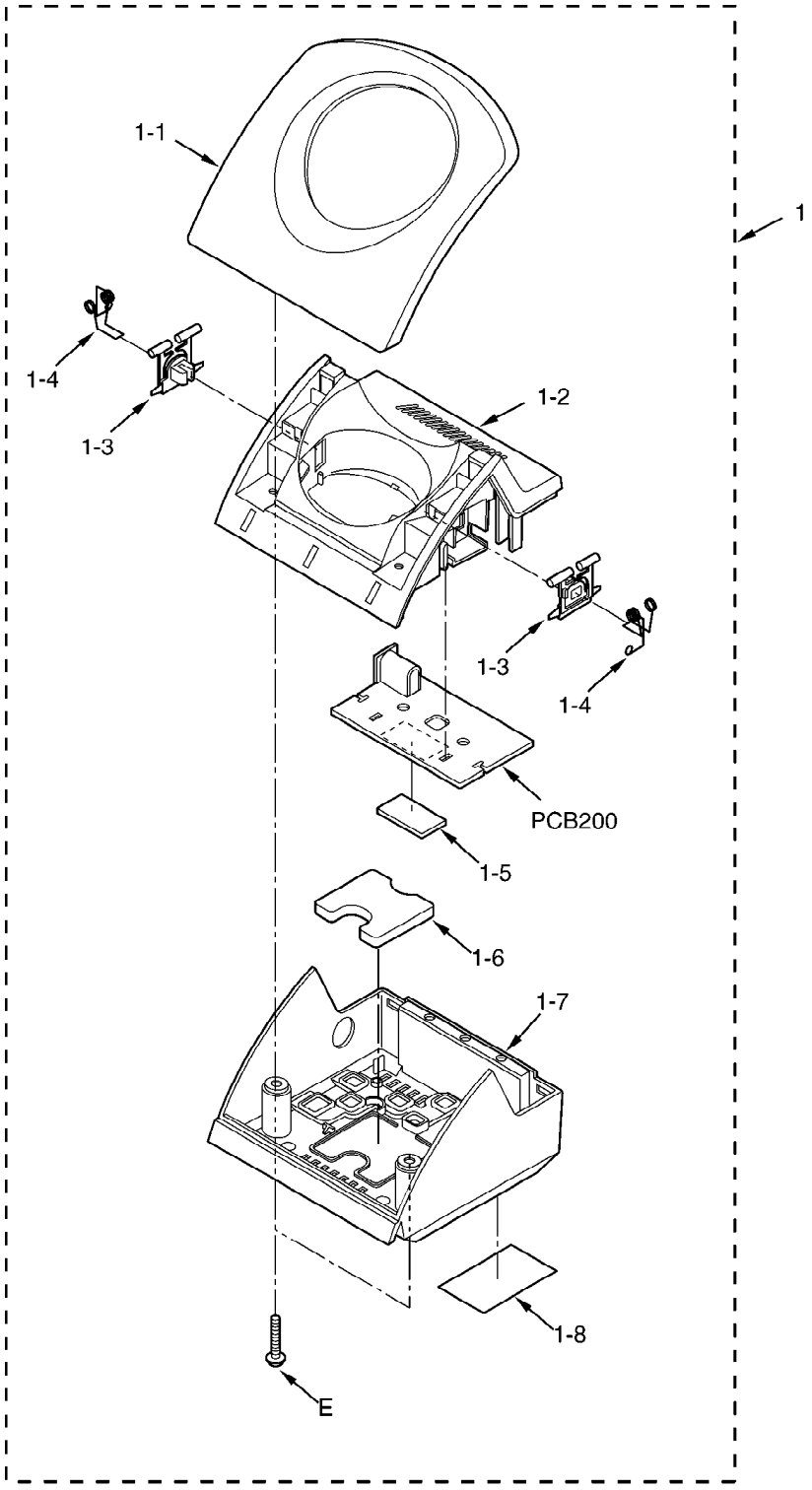
Ref.No.	Part No.	Figure
A	XTW26+12P	 ϕ2.6×12mm
F	XTW26+12P	 ϕ2.6×12mm

32. CABINET AND ELECTRICAL PARTS LOCATION (HANDSET)



Ref.No.	Part No.	Figure
B	XTB2+10G	φ2 × 10mm
C	XTB2+8G	φ2 × 8mm
D	XTB2+8G	φ2 × 8mm

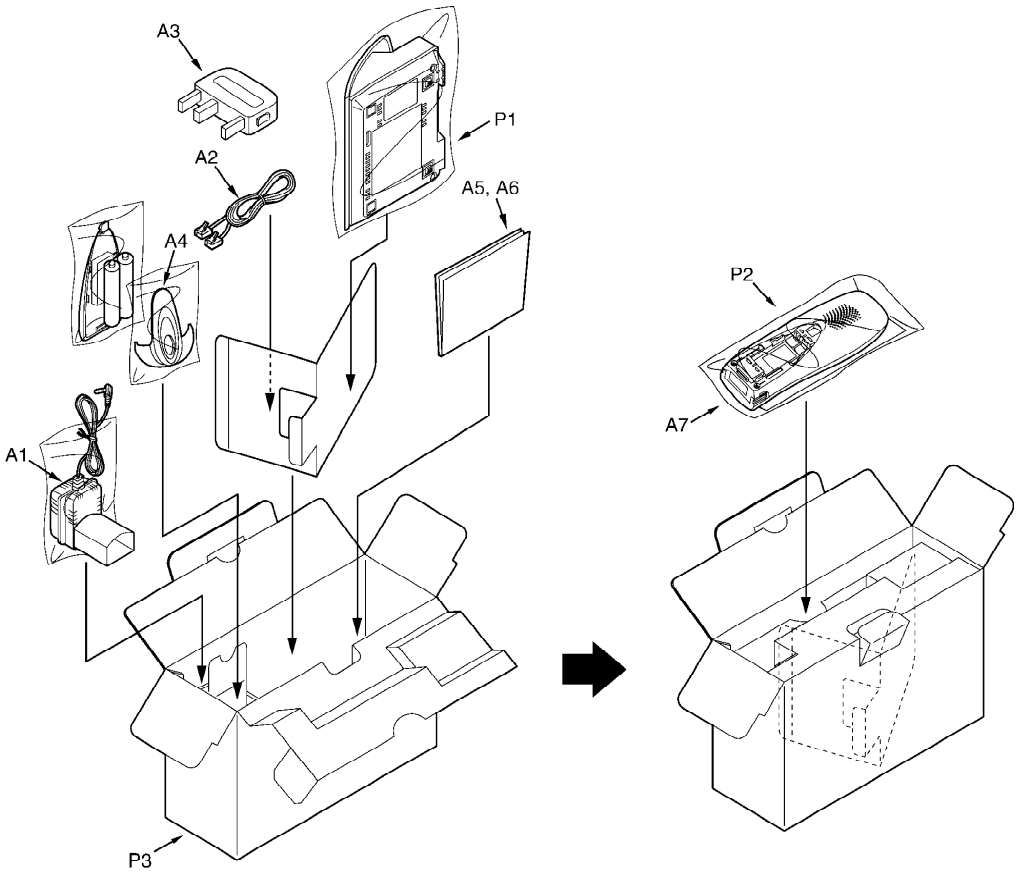
33. CABINET AND ELECTRICAL PARTS LOCATION (CHARGER UNIT)



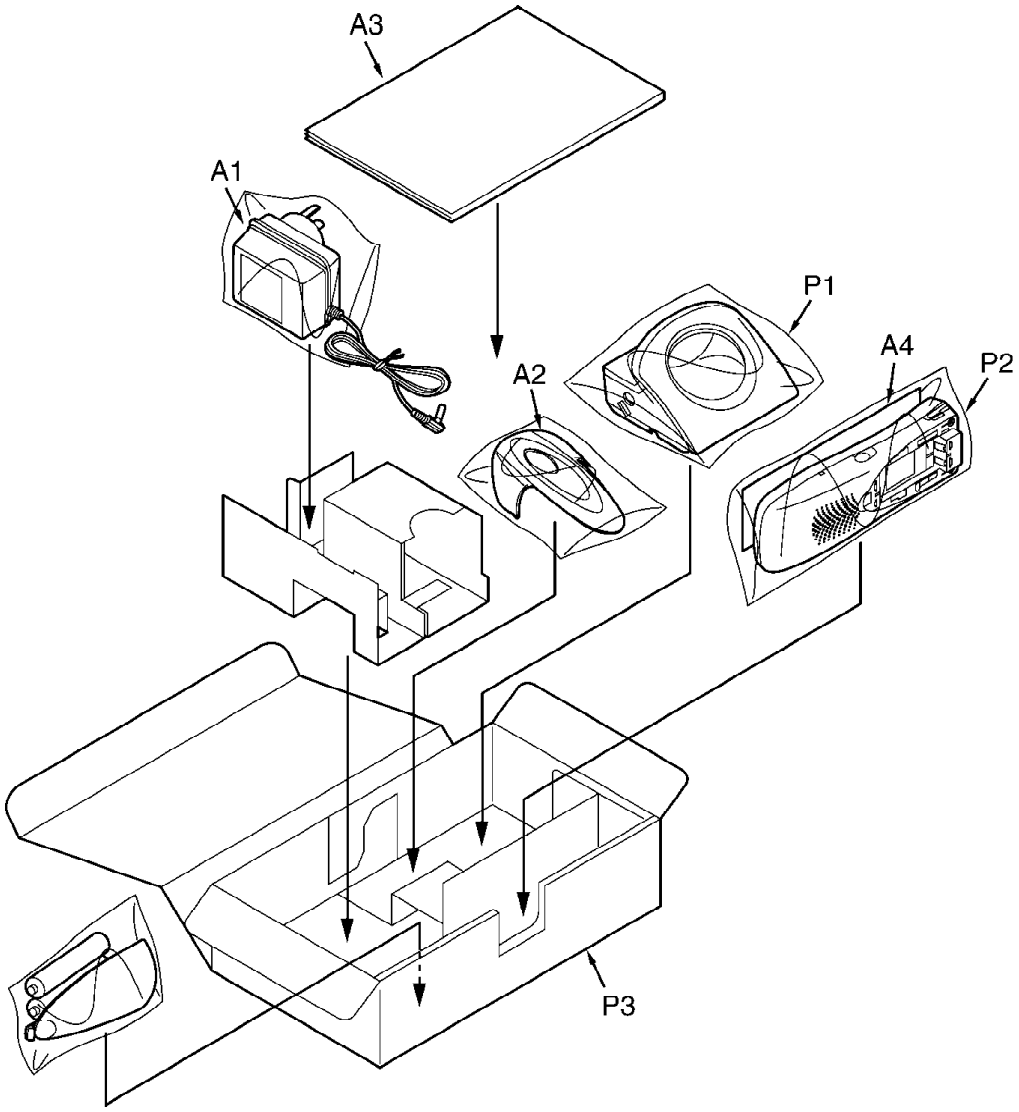
Ref.No.	Part No.	Figure
E	XTW26+14P	ϕ2.6 × 14mm

34. ACCESSORIES AND PACKING MATERIALS

34.1. KX-TCD510ALV

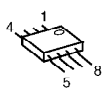
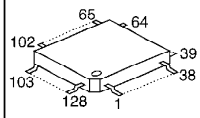
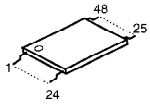
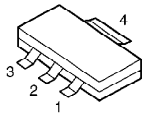
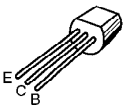
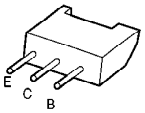
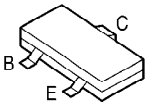
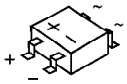
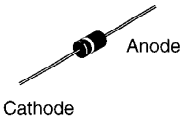
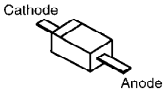
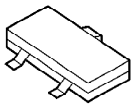
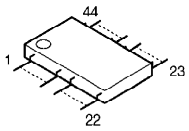


34.2. KX-TCA151AZV

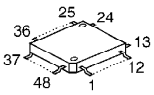
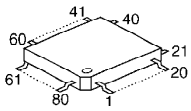
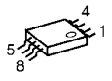
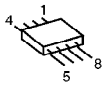
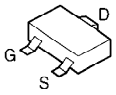
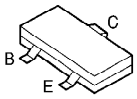
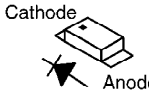
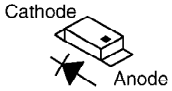
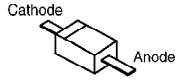


35. TERMINAL GUIDE OF THE ICs, TRANSISTORS AND DIODES

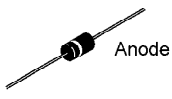
35.1. Base Unit

 PQWI2D510ALH C0JBAE000255	 C1CB00001597	 PQWI1D510ALH	 PQVILM1117MP	 2SA1625
 2SD1994A	 PQVTBF822T7, B1ADGE000004 B1ABGE000006, B1ABCE000009		 PQVDS1ZB60F1	 B0JAME000085
 MA1Z300 MA111, MA8047 MA8220, MA8036H	 B0DDCM000001	 PQWI3D510ALH		

35.2. Handset

 C1BB00000783	 C1CB00001598	 C1BB00000265	 PQWI1D510ALR PQWI1D151AZR C0JBAB000371	 PQVTFDN335N
 PSVTDTC143X, PQVT143XK146, UN9219J, B1ADGE000004, B1ABCF000103	 B3AEB0000029 LNJ308G8JRA	 PQVDBR1111C	 B0BC2R1A0006 MA8036H MA8047 B0JCDD000002 MA2Z72000 B0JCME000035	

35.3. Charger Unit

 B0JAME000085

36. REPLACEMENT PARTS LIST

1. RTL (Retention Time Limited)

Note:
The marking (RTL) indicates that the Retention Time is limited for this item.
After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependant on the type of

assembly, and in accordance with the laws governing part and product retention. After the end of this period, the assembly will no longer be available.

2. Important safety notice
Components identified by the ⚠ mark indicates special characteristics important for safety. When replacing any of these components, only use specified manufacture's parts.

3. The S mark means the part is one of some identical parts. For that reason, it may be different from the installed part.

4. ISO code (Example: ABS-94HB) of the remarks column shows quality of the material and a flame resisting grade about plastics.

5. RESISTORS & CAPACITORS
Unless otherwise specified;
All resistors are in ohms (Ω) K=1000 Ω , M=1000k Ω
All capacitors are in MICRO FARADS (μ F)P= μ μ F
***Type & Wattage of Resistor**

Type

ERC:Solid ERDS:Carbon ERJ:Chip	ERX:Metal Film ERG:Metal Oxide ER0:Metal Film	PQ4R:Chip ERS:Fusible Resistor ERF:Cement Resistor

Wattage

10,16:1/8W	14,25:1/4W	12:1/2W	1:1W	2:2W	3:3W

*Type & Voltage Of Capacitor

Type

ECFD:Semi-Conductor ECQS:Styrol ECUV,PQCUV,ECUE:Chip ECQMS:Mica	ECCD,ECKD,ECBT,F1K,ECUV:Ceramic ECQE,ECQV,ECQG:Polyester ECEA,ECST,EEE:Electlytic ECQP:Polypropylene

Voltage

ECQ Type	ECQG ECQV Type	ECSZ Type	Others	
1H:50V 2A:100V 2E:250V 2H:500V	05:50V 1:100V 2:200V	0F:3.15V 1A:10V 1V:35V 0J:6.3V	0J :6.3V 1A :10V 1C :16V 1E,25:25V	1V :35V 50,1H:50V 1J :16V 2A :100V

36.1. Base Unit

36.1.1. Cabinet and Electrical Parts

Ref. No.	Part No.	Part Name & Description	Remarks
1	PQGB10019Z1	BADGE, PANASONIC	ABS-HB
2	PQGG10160X2	GRILLE	
3	PQKM10586X6	CABINET BODY	ABS-HB
4	PQJT10203Z	TERMINAL	
5	PQKE10356Z1	GUIDE, CHARGE TERMINAL CASE	POM-HB
6	PQMC10479Z	MAGNETIC SHIELD, COPPER FOIL SHEET	
7	PQSA10131Z	ANTENNA, MAIN	
8	PQSA10132Z	ANTENNA, SUB	
9	PQYF10560Z5	CABINET COVER	ABS-HB
10	PQGT16394Z	NAME PLATE	
11	PQHS10618Z	FELT PARTS, TAPE	
12	PQHX11239Z	SPACER	

36.1.2. Main P.C.Board Parts

Note:
When replacing IC3, IC6, IC7, data need to be written to them with PQZZTCD510AL.

Ref. No.	Part No.	Part Name & Description	Remarks
PCB1	PQWP1D510ALH	MAIN P.C.BOARD ASS'Y (RTL)	
		(ICs)	
IC1	PQVILM1117MP	IC	S
IC2	C1CB00001597	IC	
IC3	PQWI2D510ALH	IC	
IC6	PQWI3D510ALH	IC	
IC7	PQWI1D510ALH	IC	
IC8	C0JBAE000255	IC	
		(TRANSISTORS)	
Q2	B1ADGE000004	TRANSISTOR(SI)	
Q3	B1ADGE000004	TRANSISTOR(SI)	
Q4	2SA1625	TRANSISTOR(SI)	S
Q5	PQVTBF822T7	TRANSISTOR(SI)	
Q8	2SD1994A	TRANSISTOR(SI)	
Q9	B1ABCE000009	TRANSISTOR(SI)	
Q10	B1ABGE000006	TRANSISTOR(SI)	
Q13	B1ABGE000006	TRANSISTOR(SI)	
		(DIODES)	
D1	B0JAME000085	DIODE(SI)	
D3	PQVDS1ZB60F1	DIODE(SI)	S
D4	MA1Z300	DIODE(SI)	S
D5	MA111	DIODE(SI)	S
D6	MA8220	DIODE(SI)	S
D7	MA8047	DIODE(SI)	S
D8	MA8047	DIODE(SI)	S
D9	MA8047	DIODE(SI)	S
D10	MA8036H	DIODE(SI)	S
D11	MA111	DIODE(SI)	S
D12	MA111	DIODE(SI)	S
D13	MA111	DIODE(SI)	S
DA1	B0DDCM000001	DIODE(SI)	
		(COILS)	

Ref. No.	Part No.	Part Name & Description	Remarks
L1	PQLQR4D4R7K	COIL	
L3	PQLQR2M33NK	COIL	
L6	PQLQXF330K	COIL	S
L7	PQLQXF330K	COIL	S
		(JACKS)	
CN1	PQJJ1TB26Z	JACK/SOCKET	S
CN2	PQJJ1B4Y	JACK/SOCKET	
		(RESISTORS)	
R4	ERJ1WYJ220	22	
R5	ERJ1WYJ220	22	
R8	ERJ3GEYJ101	100	
R9	ERJ3GEYJ221	220	
R10	ERJ3GEYJ473	47K	
R12	ERJ3GEYJ562	5.6K	
R13	ERJ3GEYF563	56K	
R14	ERJ3GEYF243	24K	
R15	ERJ3GEYJ153	15K	
R16	ERJ3GEYJ223	22K	
R17	ERJ3GEYJ223	22K	
R22	ERJ3GEYJ562	5.6K	
R23	ERJ3GEYJ104	100K	
R24	ERJ3GEYJ101	100	
R25	ERJ3GEYJ562	5.6K	
R26	ERJ3GEYJ103	10K	
R27	ERJ3GEYJ562	5.6K	
R28	ERJ3GEYJ222	2.2K	
R29	ERJ3GEYJ101	100	
R30	ERJ3GEY0R00	0	
R32	ERJ3GEYJ101	100	
R34	PQ4R18XJ000	0	S
R38	ERJ3GEYJ104	100K	
R39	ERJ3GEYJ560	56	
R42	ERJ3GEYJ273	27K	
R43	ERJ3GEYJ822	8.2K	
R44	ERJ3GEYJ182	1.8K	
R45	ERJ12YJ120	12	
R46	ERJ12YJ270	27	
R47	ERJ3GEYJ104	100K	
R48	ERJ3GEYJ473	47K	
R49	ERJ3GEYJ560	56	
R50	PQ4R18XJ100	10	S
R51	ERJ3GEYJ103	10K	
R52	ERJ3GEYJ221	220	
R53	ERJ3GEYJ222	2.2K	
R54	ERJ3GEYJ182	1.8K	
R55	ERJ3GEYJ102	1K	
R56	ERJ3GEYJ103	10K	
R57	ERJ3GEYJ103	10K	
R59	ERJ3GEYJ103	10K	
R60	ERJ3GEYJ220	22	
R61	ERJ3GEYJ220	22	
R62	ERJ3GEYJ102	1K	
R64	ERJ3GEYJ102	1K	
R65	ERJ8GEYJ390	39	

Ref. No.	Part No.	Part Name & Description	Remarks
R67	ERJ3GEYJ565	5.6M	
R68	ERJ3GEYJ565	5.6M	
R69	ERJ3GEYJ104	100K	
R70	ERJ3GEYJ104	100K	
R71	ERJ3GEYJ104	100K	
R72	ERJ3GEYJ474	470K	
R82	PQ4R10XJ000	0	S
R84	ERJ3GEYJ102	1K	
R85	ERJ3GEY0R00	0	
R86	ERJ3GEYJ103	10K	
R87	ERJ3GEYJ103	10K	
R88	ERJ3GEYJ103	10K	
R91	ERJ3GEYJ181	180	
R92	ERJ3GEYJ181	180	
R100	ERJ3GEYJ103	10K	
R101	ERJ3GEYJ103	10K	
R105	ERJ3GEYJ103	10K	
R106	ERJ3GEYJ273	27K	
R107	ERJ3GEYJ273	27K	
R108	ERJ3GEYJ103	10K	
R109	ERJ3GEYJ103	10K	
R111	ERJ3GEYJ103	10K	
R112	ERJ3GEY0R00	0	
R113	ERJ3GEYJ223	22K	
R114	ERJ3GEYJ562	5.6K	
		(CAPACITORS)	
C1	ECUV1H100DCV	10P	
C2	ECEA1CK101	100	S
C3	ECEA0JU331	330	
C7	ECEA1CKA100	10	
C8	ECUV1H040CCV	4P	
C11	ECEA1CKA100	10	
C12	ECQE2223KF	0.022	
C13	ECQE2223KF	0.022	
C17	ECUV1H561KBV	560P	
C18	ECUV2H332KB	0.0033	
C20	ECUV1C104KBV	0.1	
C21	ECUV1H100DCV	10P	
C22	ECUV1H561KBV	560P	
C24	ECUV1C104KBV	0.1	
C27	ECUV1H100DCV	10P	
C28	ECUV1C224KBV	0.22	
C30	ECUV1C683KBV	0.068	
C32	ECUV1C223KBV	0.022	
C33	ECUV1A105KBV	1	
C34	ECUV1C105ZFV	1	
C36	ECUV1H472KBV	0.0047	S
C37	ECUV1C104KBV	0.1	
C38	ECUV1C823KBV	0.082	
C39	ECUV1A105KBV	1	
C40	PQCUV1A225KB	2.2	
C41	PQCUV1C224KB	0.22	
C42	ECUV1H300JCV	30P	
C43	ECUV1H120JCV	12P	

Ref. No.	Part No.	Part Name & Description	Remarks
C44	ECUV1C104KBV	0.1	
C45	ECUV1C104KBV	0.1	
C46	PQCUV1A105KB	1	
C47	PQCUV1C224KB	0.22	
C48	ECUV1C104KBV	0.1	
C49	ECEA1HKS100	10	S
C50	PQCUV1E104MD	0.1	S
C51	ECUV1H101JCV	100P	
C52	ECUV1E333KBV	0.033	
C53	ECUV1C104KBV	0.1	
C54	ECUV1A475KB	4.7	
C55	ECUV1H220JCV	22P	
C57	ECUV1H100DCV	10P	
C58	ECUV1H100DCV	10P	
C59	ECUV1H030CCV	3P	
C60	ECUV1H101JCV	100P	
C62	ECUV1H030CCV	3P	
C63	ECUV1H330JCV	33P	
C64	ECUV1H010CCV	1P	
C65	ECUV1C104KBV	0.1	
C66	ECUV1C104KBV	0.1	
C67	ECUV1C105ZFV	1	
C68	ECUV1C105ZFV	1	
C71	ECUV1H020CCV	2P	
C72	ECUV1H562KBV	0.0056	
C73	ECUV1A475KB	4.7	
C74	ECUV1H103KBV	0.01	
C75	ECUV1H103KBV	0.01	
C76	ECUV1C104KBV	0.1	
C82	ECUV1H020CCV	2P	
C84	ECUV1H020CCV	2P	
C100	ECUV1H100DCV	10P	
C101	ECUV1H682KBV	0.0068	S
C102	ECUV1H682KBV	0.0068	S
C103	ECUV1C104KBV	0.1	
C104	ECUV1H060DCV	6P	S
C105	ECUV1H100DCV	10P	
C107	ECUV1H102KBV	0.001	
C108	PQCUV1A225KB	2.2	
C109	PQCUV1A105KB	1	
C110	ECUV1H103KBV	0.01	
C113	ECUV1H102KBV	0.001	
C114	ECUV1H020CCV	2P	
C115	ECUV1C104KBV	0.1	
C119	PQCUV1A225KB	2.2	
C120	ECUV1H100DCV	10P	
C121	ECUV1H101JCV	100P	
C122	ECUV1H101JCV	100P	
C123	ECUV1H101JCV	100P	
C126	ECUV1H101JCV	100P	
C127	ECUV1H101JCV	100P	
C128	ECUV1H101JCV	100P	
C129	ECUV1H100DCV	10P	
C130	ECUV1H100DCV	10P	

Ref. No.	Part No.	Part Name & Description	Remarks
R41	ECUV1H100DCV	10P	
		(OTHERS)	
CN4	L0DACA000016	BUZZER	
IC4	J3FKK0000003	RF UNIT	
SA1	PQVDDSS301L	VARISTOR (SURGE ABSORBER)	S
SW1	K0H1BB000018	SPECIAL SWITCH	
X1	H0D103500003	CRYSTAL OSCILLATOR	

36.2. Handset

36.2.1. Cabinet and Electrical Parts

Ref. No.	Part No.	Part Name & Description	Remarks
101	PQGG10159Z1	GRILLE, LCD	ABS-HB
102	PQGP10230Z2	PANEL, KEY	ABS-HB
103	PQGP10231Z	PANEL, LCD	PC-HB
104	PQHS10567Z	TAPE, DOUBLE SIDE (LCD)	
105	PQHS10568Z	TAPE, DOUBLE SIDE (KEY)	
106	PQKM10595Z2	CABINET BODY	ABS-HB
107	PQGP10232Z	OPTIC CONDUCTIVE PARTS, LED LENS	ABS-HB
108	PQHE10141Z	SPACER, LCD SPONGE	
109	PQBX10369Z1	PUSH BUTTON, TALK	ABS-HB
110	PQBC10380Z1	PUSH BUTTON, SP PHONE	ABS-HB
111	PQSX10226Y	KEYBOARD SWITCH	
112	PQHS10467Z	COVER, SP NET	
113	L0AD02A00015	SPEAKER	
114	PQBC10381Z1	PUSH BUTTON, CURSOL	ABS-HB
115	PQSA10134Z	ANTENNA	
116	PQHX11202Z	INSULATOR, SHEET	
117	PQJT10204Z	TERMINAL (L)	
118	PQJT10205Z	TERMINAL (R)	
119	PQHR10964Z	GUIDE, SPEAKER	ABS-HB
120	L0AD02A00010	SPEAKER	
121	PQHG10666Z	SPACER, SP RUBBER SHEET	
122	PQHS10457Z	COVER, SP NET	
123	PQJC10056Z	BATTERY TERMINAL C	
124	PQJC10057Z	BATTERY TERMINAL A	
125	PQJC10058Z	BATTERY TERMINAL B	
126	PQKE10357Z2	COVER, EARPHONE	
127	PQKF10583Y7	CABINET COVER	ABS-HB
128	PQGT16395Z	NAME PLATE	
129	PQHX11245Z	PLASTIC PARTS, BATTERY COVER SHEET	
130	PQHS10561Y	SPACER, BATTERY COVER	
131	PQKK10134Y7	LID, BATTERY COVER	ABS-HB

36.2.2. Main P.C.Board Parts

Note:
When replacing IC10, data need to be written to them with PQZZTCD510AL.

Ref. No.	Part No.	Part Name & Description	Remarks
PCB100	PQWP1D510ALR	MAIN P.C.BOARD ASS'Y (RTL) (for KX-TCD510ALV)	
PCB100	PQWP1D151AZR	MAIN P.C.BOARD ASS'Y (RTL) (for KX-TCA151AZV)	
		(ICs)	
IC1	C1CB00001598	IC	
IC2	C1BB00000265	IC	
IC4	C1BB00000783	IC	
IC5	C0JBAB000371	IC	
IC10	PQWI1D510ALR	IC (for KX-TCD510ALV)	
IC10	PQWI1D151AZR	IC (for KX-TCA151AZV)	
		(TRANSISTORS)	
Q1	PQVTFDN335N	TRANSISTOR(SI)	S
Q2	B1ADGE000004	TRANSISTOR(SI)	
Q3	B1ADGE000004	TRANSISTOR(SI)	
Q4	B1ADGE000004	TRANSISTOR(SI)	
Q5	B1ABCF000103	TRANSISTOR(SI)	
Q7	PQVT143XK146	TRANSISTOR(SI)	S
Q8	B1ADGE000004	TRANSISTOR(SI)	
Q9	UN9219J	TRANSISTOR(SI)	
Q10	PSVTDTC143X	TRANSISTOR(SI)	S
Q11	PSVTDTC143X	TRANSISTOR(SI)	S
		(DIODES)	
D1	B0JCME000035	DIODE(SI)	
D3	MA8036H	DIODE(SI)	
D4	MA8047	DIODE(SI)	
D5	MA8047	DIODE(SI)	
D6	B0BC2R1A0006	DIODE(SI)	
D7	MA2Z72000	DIODE(SI)	
D8	B0JCDD000002	DIODE(SI)	
LED1	B3AEB0000029	LED	
LED2	B3AEB0000029	LED	
LED4	LNJ308G8JRA	LED	
LED5	LNJ308G8JRA	LED	
LED6	LNJ308G8JRA	LED	
LED7	LNJ308G8JRA	LED	
LED8	LNJ308G8JRA	LED	
LED9	PQVDBR1111C	LED	S
LED10	PQVDBR1111C	LED	S
		(COILS)	
F1	PQLQR2M5N6K	COIL	S
L1	G1A470L00001	COIL	
L2	PQLQR4D4R7K	COIL	
L4	G1C100MA0072	COIL	
L5	G1C100MA0072	COIL	
		(CRYSTAL OSCILLATORS)	
X1	H0D103500002	CRYSTAL OSCILLATOR	
X2	H2D600400004	CRYSTAL OSCILLATOR	
		(RESISTORS)	
R1	ERJ6RSJR10V	0.1	
R2	ERJ3EKF6802	68K	S
R3	ERJ3EKF1803	180K	S
R4	ERJ3GEYJ153	15K	
R5	ERJ3GEYJ471	470	
R6	ERJ3GEYJ103	10K	
R7	ERJ3GEYJ224	220K	

Ref. No.	Part No.	Part Name & Description	Remarks
R9	ERJ3GEYJ562	5.6K	
R10	ERJ3GEYF203	20K	
R11	ERJ3GEYF103	10K	
R12	ERJ3GEYJ393	39K	
R14	ERJ3GEYJ330	33	
R15	ERJ3GEYJ100	10	
R17	ERJ3GEYJ470	47	
R18	ERJ3GEYJ121	120	
R20	ERJ3GEYJ102	1K	
R21	ERJ3GEYJ102	1K	
R24	ERJ3GEYJ474	470K	
R25	ERJ3GEYJ331	330	
R26	ERJ3GEYJ101	100	
R29	ERJ3GEYJ222	2.2K	
R34	ERJ3GEYJ184	180K	
R35	ERJ3GEYJ273	27K	
R36	ERJ3GEYJ683	68K	
R37	ERJ3GEYJ330	33	
R38	ERJ3GEYJ330	33	
R39	ERJ3GEYJ103	10K	
R40	ERJ3GEYJ223	22K	
R43	ERJ6RQJR22	0.22	
R46	ERJ3GEYJ562	5.6K	
R47	ERJ3GEYJ562	5.6K	
R48	ERJ3GEYJ330	33	
R50	ERJ3GEYJ101	100	
R51	ERJ3GEYJ105	1M	
R52	ERJ3GEYJ183	18K	
R55	ERJ3GEYJ103	10K	
R57	ERJ3GEYJ680	68	
R58	ERJ3GEYJ2R2	2.2	
R59	ERJ3GEYJ560	56	
R60	ERJ3GEYJ102	1K	
R61	ERJ3GEYJ103	10K	
R62	ERJ3GEYJ103	10K	
R63	ERJ3GEYJ103	10K	
R64	ERJ3GEYJ103	10K	
R66	ERJ3GEYJ103	10K	
R71	ERJ3GEYJ104	100K	
R72	ERJ3GEYJ102	1K	
R73	ERJ3GEYJ564	560K	
R74	ERJ3GEY0R00	0	
R75	ERJ3GEY0R00	0	
R76	ERJ3GEYJ223	22K	
R77	ERJ3GEYJ681	680	
R80	ERJ3GEYJ100	10	
R81	ERJ3GEY0R00	0	
R90	ERJ3GEYJ103	10K	
		(CAPACITORS)	
C1	EEE0JA331P	330	
C2	ECST0JY106	10	
C3	ECUV1C104KBV	0.1	
C4	ECUV1H100DCV	10P	
C5	ECST0JY106	10	

Ref. No.	Part No.	Part Name & Description	Remarks
C7	ECUV1H100DCV	10P	
C8	ECUV1A224KBV	0.22	
C9	ECUV1C683KBV	0.068	
C10	ECUV1C104KBV	0.1	
C12	ECUV1A105KBV	1	
C13	ECUV1C104KBV	0.1	
C14	ECUV1C104KBV	0.1	
C15	ECUV1C105ZFV	1	
C16	ECUV1C104KBV	0.1	
C17	ECUV1H100DCV	10P	
C18	ECUV1H102KBV	0.001	
C19	ECUV1C104KBV	0.1	
C20	ECUV1C104KBV	0.1	
C21	ECUV1C104KBV	0.1	
C22	ECUV1C104KBV	0.1	
C23	ECUV1C104KBV	0.1	
C24	ECUV1C104KBV	0.1	
C27	ECUV1A105KBV	1	S
C28	ECUV1A105KBV	1	S
C29	ECUV1A105KBV	1	S
C30	ECUV1A105KBV	1	S
C31	ECUV1C474KBV	0.47	
C32	ECUV1C474KBV	0.47	
C33	ECUV1C474KBV	0.47	
C34	ECUV1C474KBV	0.47	
C35	ECUV1C474KBV	0.47	
C37	ECUV1C683KBV	0.068	
C38	ECUV1H471JCV	470P	S
C39	ECUV1A105ZFV	1	
C40	ECST0JY106	10	
C42	ECUV1A106ZF	10	S
C44	ECUV1A105ZFV	1	
C45	ECUV1C104KBV	0.1	
C46	ECUV1C104KBV	0.1	
C47	ECUV1C104KBV	0.1	
C48	ECUV1C473KBV	0.047	
C49	ECUV1C104KBV	0.1	
C52	ECUV1C104KBV	0.1	
C54	ECUV1H330JCV	33P	
C55	ECUV1C104KBV	0.1	
C56	ECUV1H680JCV	68P	
C57	EEE0JA331P	330	
C58	ECUV1C104KBV	0.1	
C59	ECUV1A105ZFV	1	
C60	ECUV1A475KB	4.7	
C61	ECUV1A105KBV	1	
C62	ECUV1A475KB	4.7	
C63	ECUV1H562KBV	0.0056	
C64	ECUV1H020CCV	2P	
C65	ECUV1H020CCV	2P	
C66	ECUV1H020CCV	2P	
C67	F1G1H100A420	10P	
C68	ECUV1C683KBV	0.068	
C69	ECUV1H020CCV	2P	

Ref. No.	Part No.	Part Name & Description	Remarks
C70	ECUV1C104KBV	0.1	
C73	ECUV1C104KBV	0.1	
C74	ECUV1C104KBV	0.1	
C75	ECUV1H100DCV	10P	
C77	ECUV1H100DCV	10P	
C80	PQCUV1A225ZF	2.2	
C81	ECUV1H020CCV	2P	
C82	ECUV1H020CCV	2P	
C86	ECUV1C105ZFV	1	
C87	ECUV1H100DCV	10P	
C89	ECUV1H100DCV	10P	
C90	ECUV1H100DCV	10P	
C91	ECUV1H100DCV	10P	
C92	ECUV1H100DCV	10P	
C93	ECUV1H101JCV	100P	
C94	ECUV1H101JCV	100P	
C100	ECUV1A105ZFV	1	
C101	ECUV1C104KBV	0.1	
		(OTHERS)	
MIC	L0CBAB000052	MICROPHONE	
IC3	J3FKK0000003	RF UNIT	
CN4	K2HD103D0001	JACK	
SW1	K0C115A00003	SEESAW SWITCH	

36.3. Charger Unit

36.3.1. Cabinet and Electrical Parts

Ref. No.	Part No.	Part Name & Description	Remarks
1	PQLV30018ZV1	HANDSET CHARGER	
1-1	PQGG10155Y6	GRILLE	ABS-HB
1-2	PQKM10591Y4	CABINET BODY	PS-HB
1-3	PQKE10356Z1	GUIDE, CHARGE TERMINAL CASE	POM-HB
1-4	PQJT10206Z	CHARGE TERMINAL	
1-5	PQHX10991Z	CUSHION, URETHANE FORM	
1-6	PQMH10426Z	WEIGHT	
1-7	PQYF10563Z4	CABINET COVER	PS-HB
1-8	PQGT16196Z	NAME PLATE	

36.3.2. Main P.C.Board Parts

Ref. No.	Part No.	Part Name & Description	Remarks
PCB200	PQWPA142ESCH	MAIN P.C.BOARD ASS'Y (RTL)	
		(DIODE)	
D1	B0JAME000085	DIODE(SI)	
		(JACK)	
J1	PQJJ1B4Y	JACK	S
		(RESISTORS)	
R1	ERJ1WYJ220	22	
R2	ERJ1WYJ270	27	

36.4. Accessories and Packing Materials

36.4.1. KX-TCD510ALV

Ref. No.	Part No.	Part Name & Description	Remarks
A1	PQLV19ALZ	AC ADAPTOR	⚠
A2	PQJA10059Z	CORD, TELEPHONE	
A3	PQJP02S13Z	CONNECTOR, PLUG	
A4	PQKE10355Z2	HANGER, BELT CLIP	PC+ABS-HB
A5	PQQX13796Z	INSTRUCTION BOOK	
A6	PQQW13005Z	QUICK GUIDE	
A7	PQQW12846W	LEAFLET, RECHARGE	
P1	PQPP10100Z	PROTECTION COVER (for Base Unit)	
P2	PQPP10084Z	PROTECTION COVER (for Handset)	
P3	PQPK14180Z	GIFT BOX	

36.4.2. KX-TCA151AZV

Ref. No.	Part No.	Part Name & Description	Remarks
A1	PQLV200ALZ	AC ADAPTOR	⚠
A2	PQKE10355Z2	HANGER, BELT CLIP	PC+ABS-HB
A3	PQQX13834Z	INSTRUCTION BOOK	
A4	PQQW12846W	LEAFLET, RECHARGE	
P1	PQPP10086Z	PROTECTION COVER (for Charger Unit)	
P2	PQPP10084Z	PROTECTION COVER (for Handset)	
P3	PQPK14170Z	GIFT BOX	

36.5. Fixtures and Tools

Part No.	Part Name & Description	Remarks
PQZZ1CD505E	JIG CABLE	
PQZZTCD510AL	BATCH FILE	

Note:
See CHECK PROCEDURE (BASE UNIT) (), and CHECK PROCEDURE (HANDSET) ().

37. FOR SCHEMATIC DIAGRAM

37.1. Base Unit (SCHEMATIC DIAGRAM (BASE UNIT))

Notes:

1. DC voltage measurements are taken with voltmeter from the negative voltage line.

Important Safety Notice:
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only the manufacturer's specified parts.

2. This schematic diagram may be modified at any time with the development of new technology.

37.2. Handset (SCHEMATIC DIAGRAM (HANDSET))

Notes:

1. DC voltage measurements are taken with an oscilloscope or a tester with a ground.
2. The schematic diagrams and circuit board may be modified at any time with the development of new technology.

38. SCHEMATIC DIAGRAM (BASE UNIT)

39. SCHEMATIC DIAGRAM (HANDSET)

40. SCHEMATIC DIAGRAM (CHARGER UNIT)

41. CIRCUIT BOARD (BASE UNIT)

41.1. Component View

41.2. Flow Solder Side View

42. CIRCUIT BOARD (HANDSET)

42.1. Component View

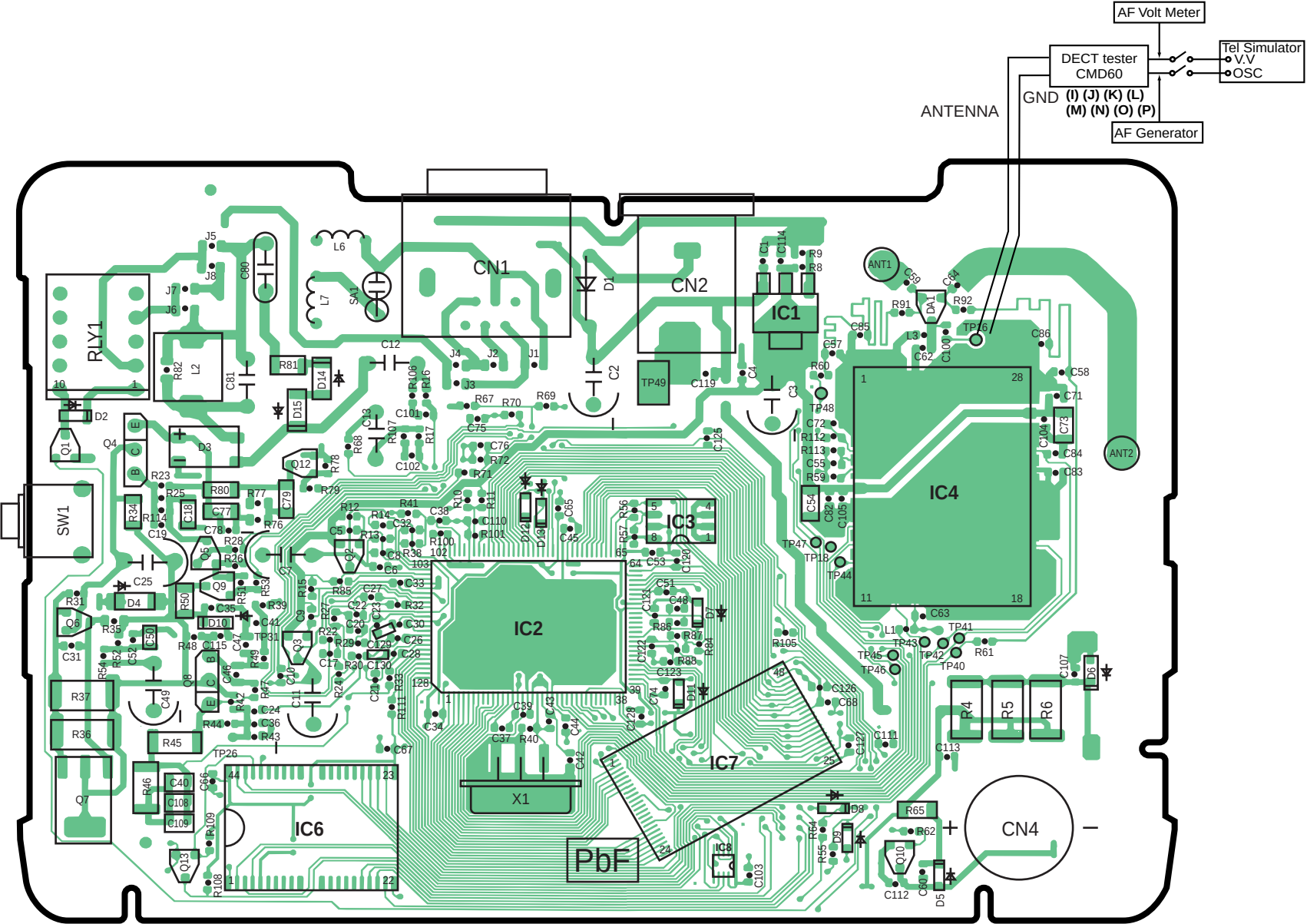
42.2. Flow Solder Side View

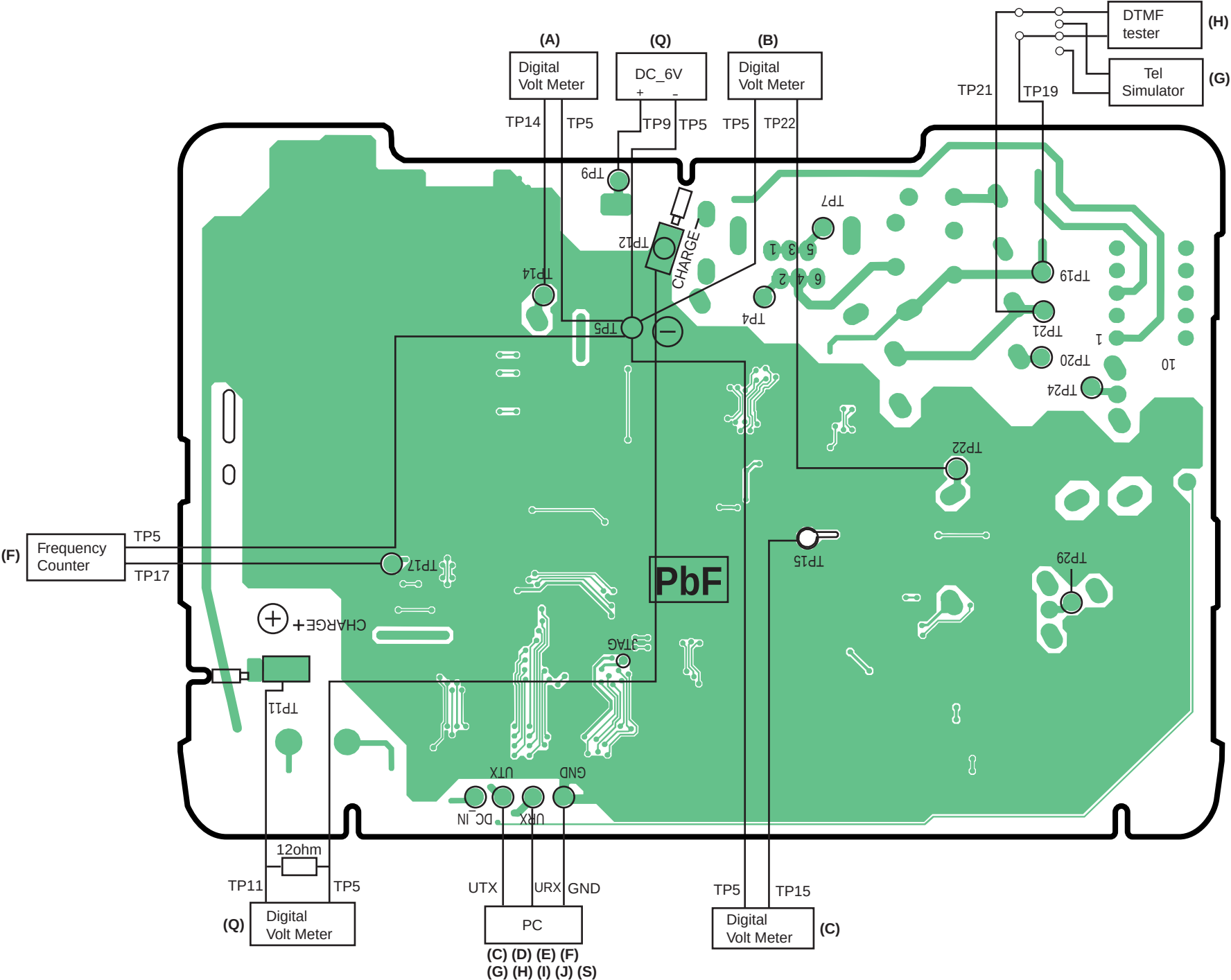
43. CIRCUIT BOARD (CHARGER UNIT)

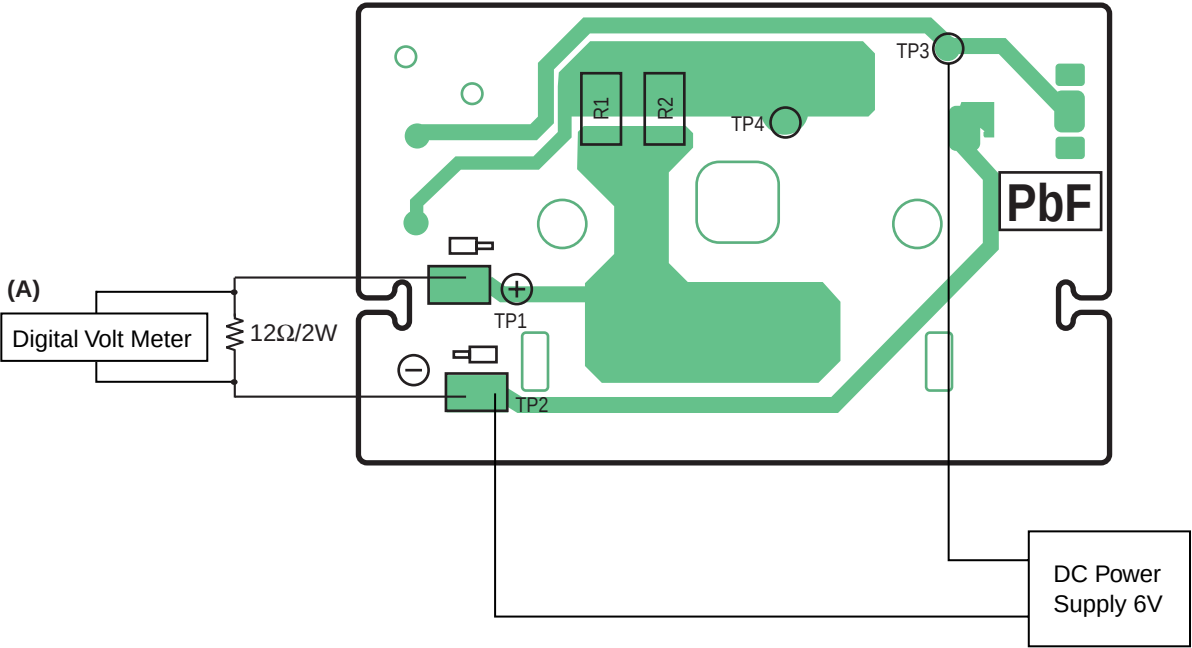
43.1. Component View

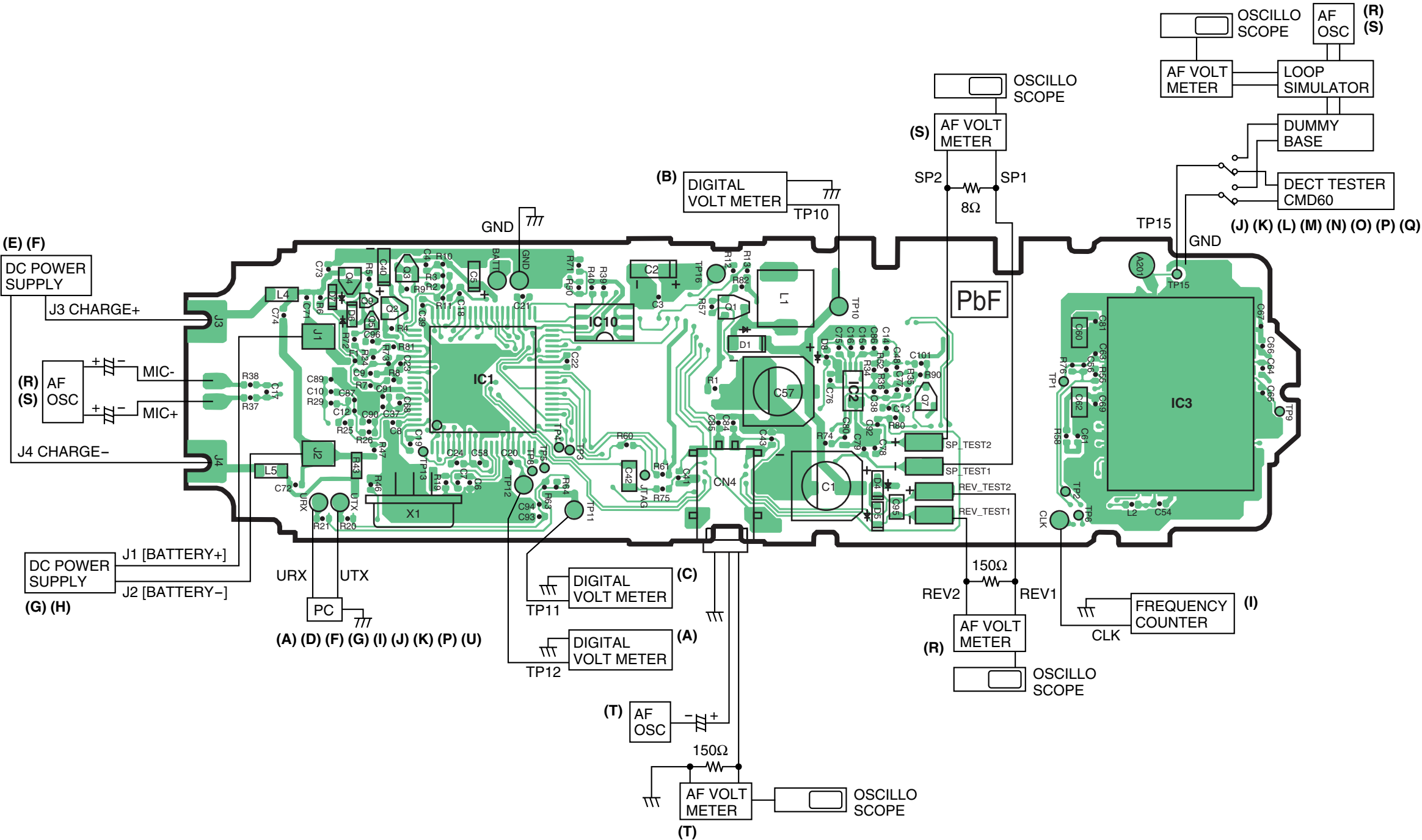
43.2. Flow Solder Side View

M / KXTCD510ALV / KXTCA151AZV


AF Volt Meter
DECT tester
CMD60
Tel Simulator
V.V
OSC
ANTENNA
GND
(I) (J) (K) (L)
(M) (N) (O) (P)
AF Generator
CN1
CN2
IC1
IC2
IC3
IC4
IC6
IC7
IC8
X1
CN4
RLY1
SW1
ANT1
ANT2
PbF


(A)
Digital Volt Meter
TP14
TP5
(Q)
DC_6V
+ -
TP9
TP5
(B)
Digital Volt Meter
TP5
TP22
DTMF tester
(H)
Tel Simulator
(G)
TP21
TP19
TP9
TP12
CHARGE
TP7
TP14
TP4
TP5
TP19
TP21
TP20
TP24
1
10
TP22
TP15
TP29
(F)
Frequency Counter
TP5
TP17
TP17
PbF
CHARGE+
JTAG
TP11
UTX
GND
DC_IN
URX
12ohm
TP11
TP5
(Q)
Digital Volt Meter
UTX
URX
GND
PC
(C) (D) (E) (F)
(G) (H) (I) (J) (S)
TP5
TP15
Digital Volt Meter
(C)


(A)
Digital Volt Meter
12Ω/2W
TP1
TP2
TP3
TP4
R1
R2
PbF
DC Power
Supply 6V


(E) (F)
DC POWER SUPPLY
J3 CHARGE+
(R) (S)
AF OSC
MIC-
MIC+
J4 CHARGE−
DC POWER SUPPLY
J1 [BATTERY+]
J2 [BATTERY−]
(G) (H)
URX
UTX
PC
(A) (D) (F) (G) (I) (J) (K) (P) (U)
GND
(B)
DIGITAL VOLT METER
TP10
(C)
DIGITAL VOLT METER
TP11
(A)
DIGITAL VOLT METER
TP12
(T)
AF OSC
150Ω
AF VOLT METER
OSCILLO SCOPE
(T)
OSCILLO SCOPE
(S)
AF VOLT METER
SP2
SP1
8Ω
PbF
150Ω
REV2
REV1
(R)
AF VOLT METER
OSCILLO SCOPE
TP15
GND
(J) (K) (L) (M) (N) (O) (P) (Q)
DECT TESTER CMD60
DUMMY BASE
LOOP SIMULATOR
AF VOLT METER
OSCILLO SCOPE
AF OSC
(R) (S)
CLK
FREQUENCY COUNTER
(I)
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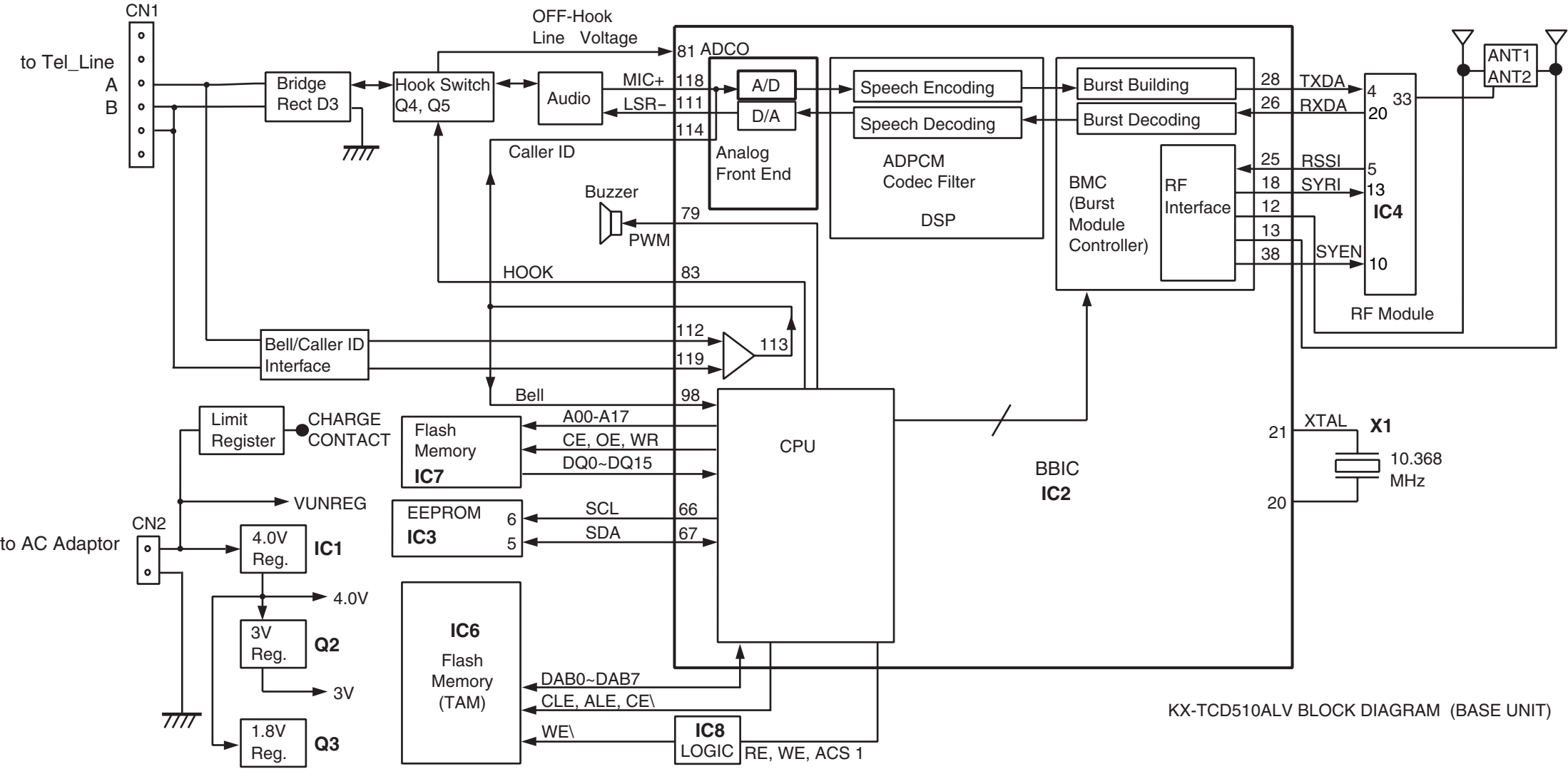
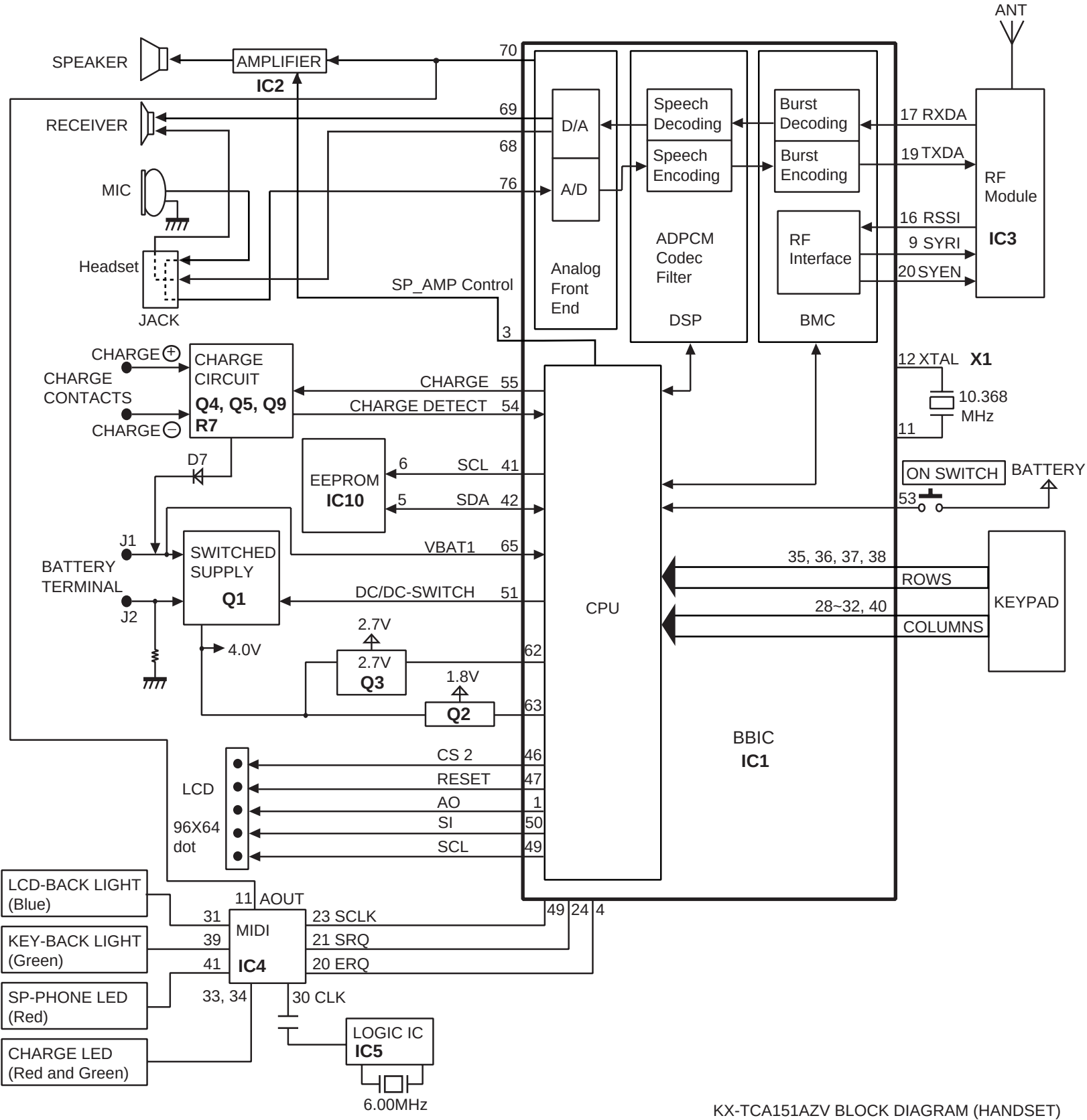
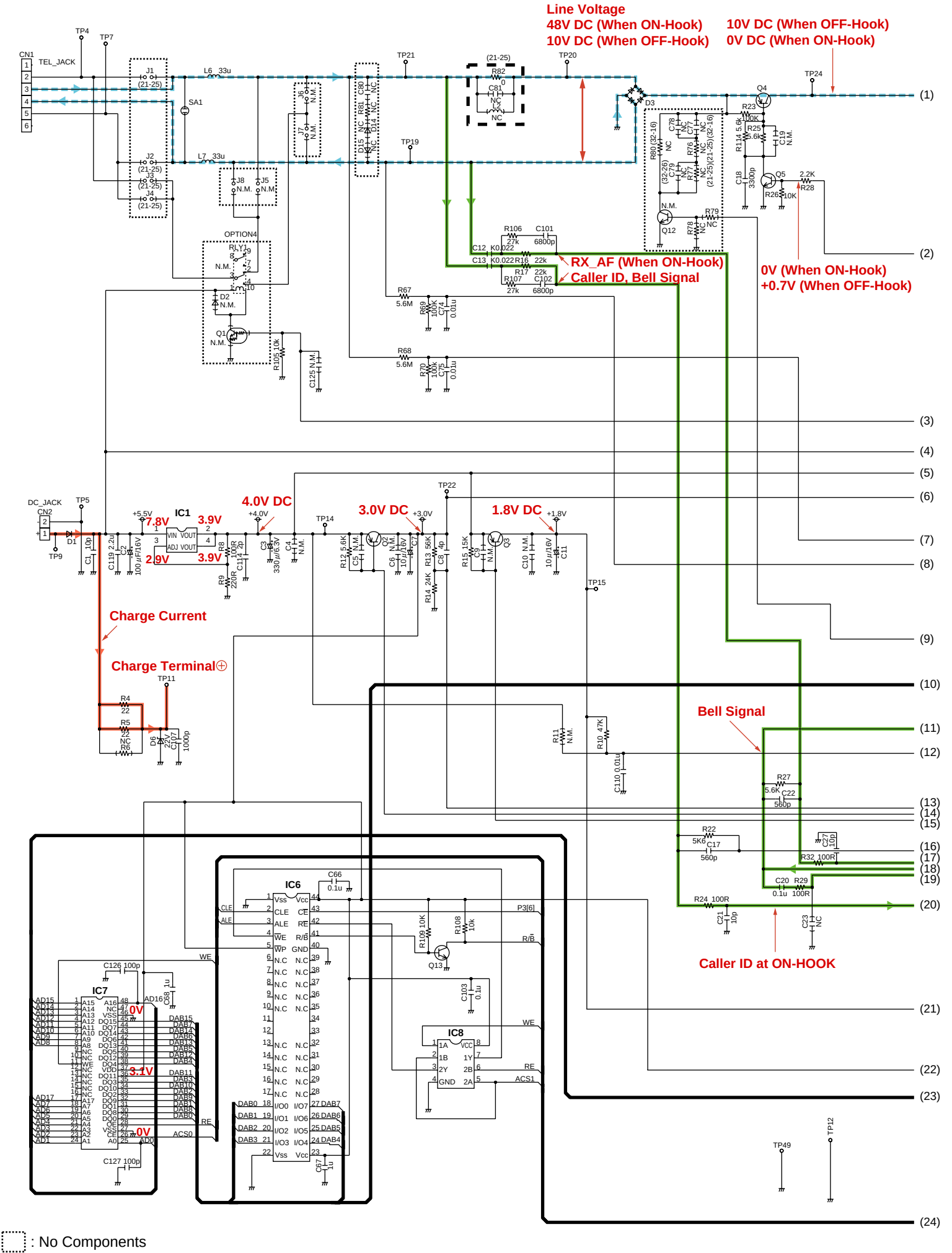
IC2
IC3
IC10
CN4
X1
SP_TEST2
SP_TEST1
REV_TEST2
REV_TEST1

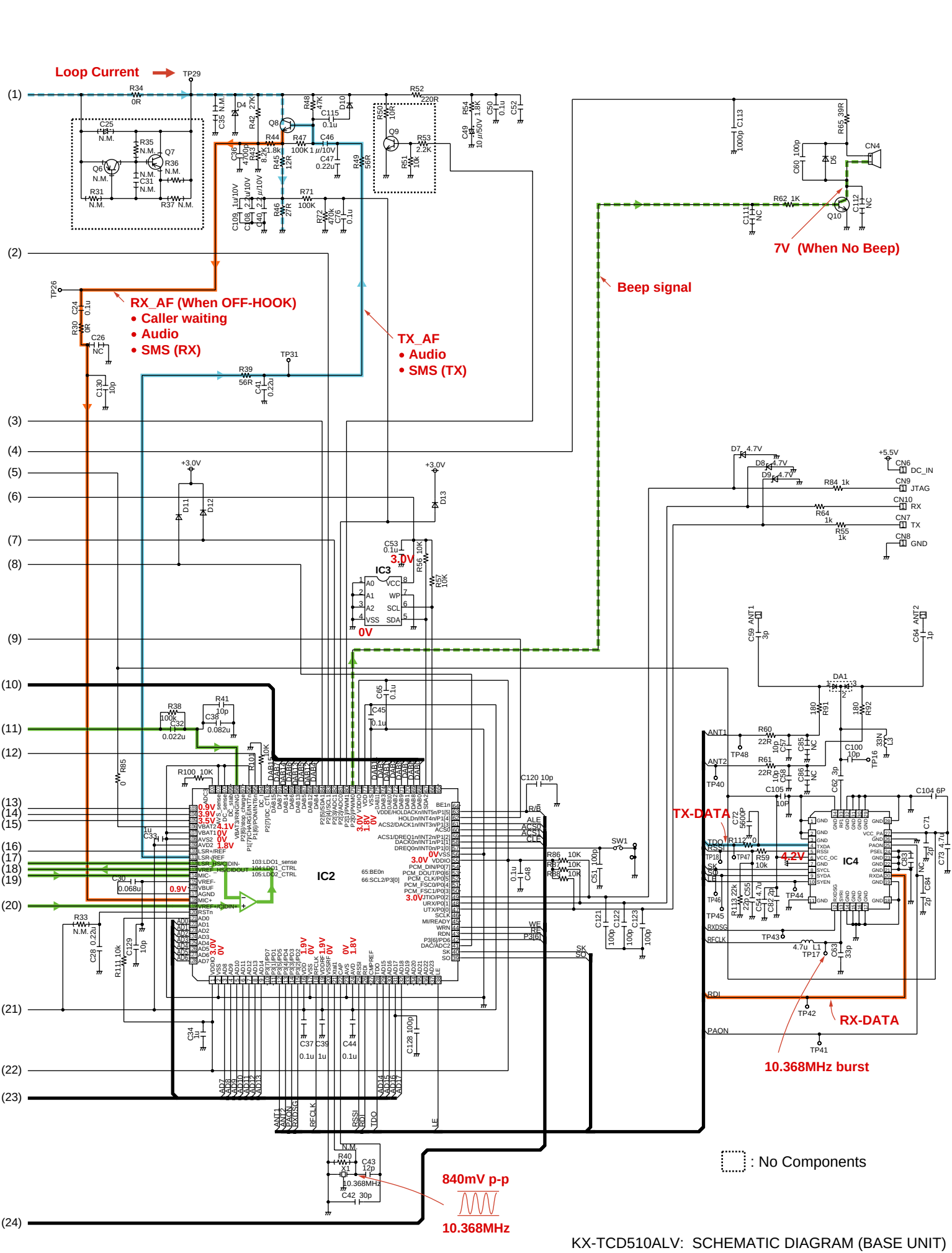


KX-TCD510ALV BLOCK DIAGRAM (BASE UNIT)

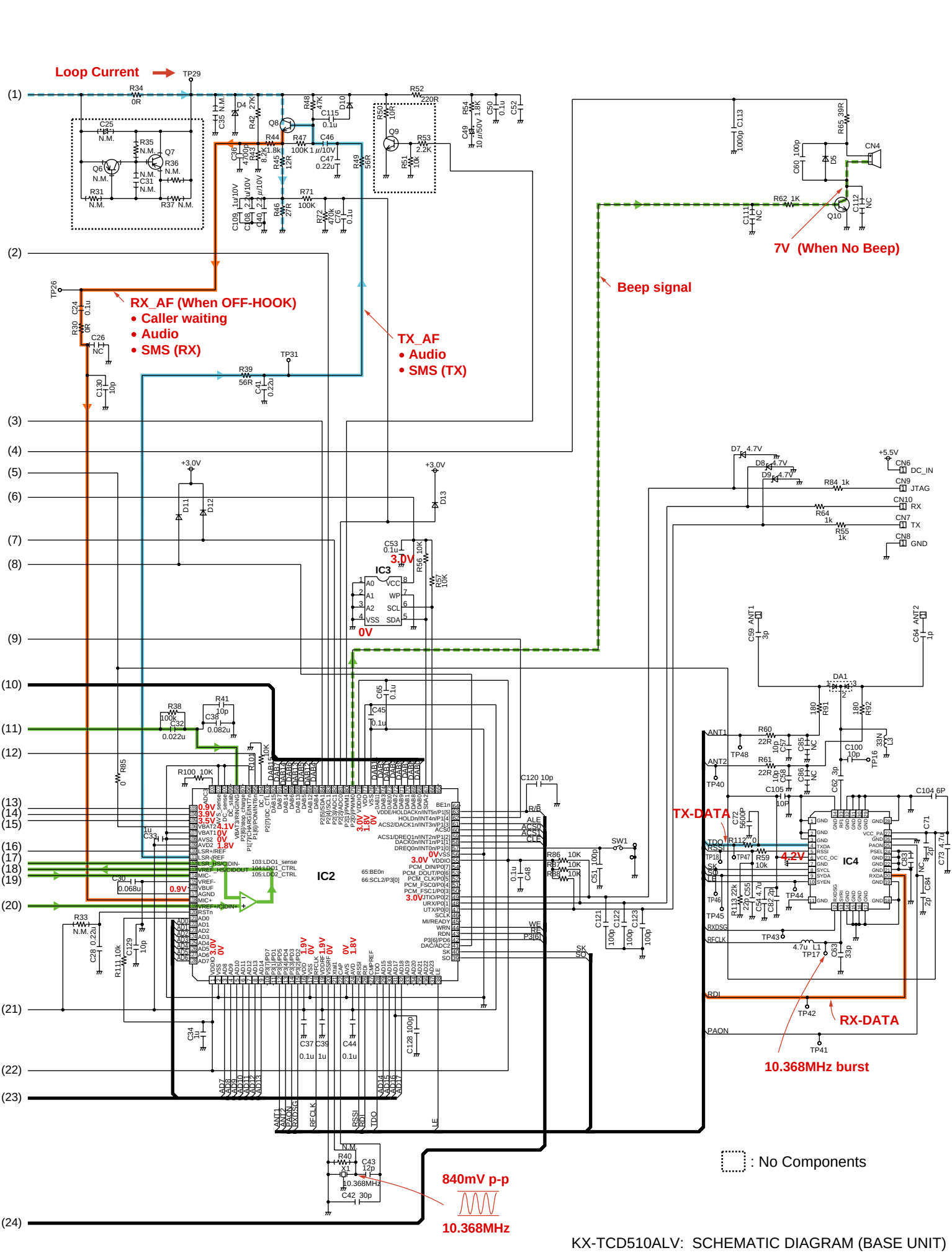


KX-TCA151AZV BLOCK DIAGRAM (HANDSET)

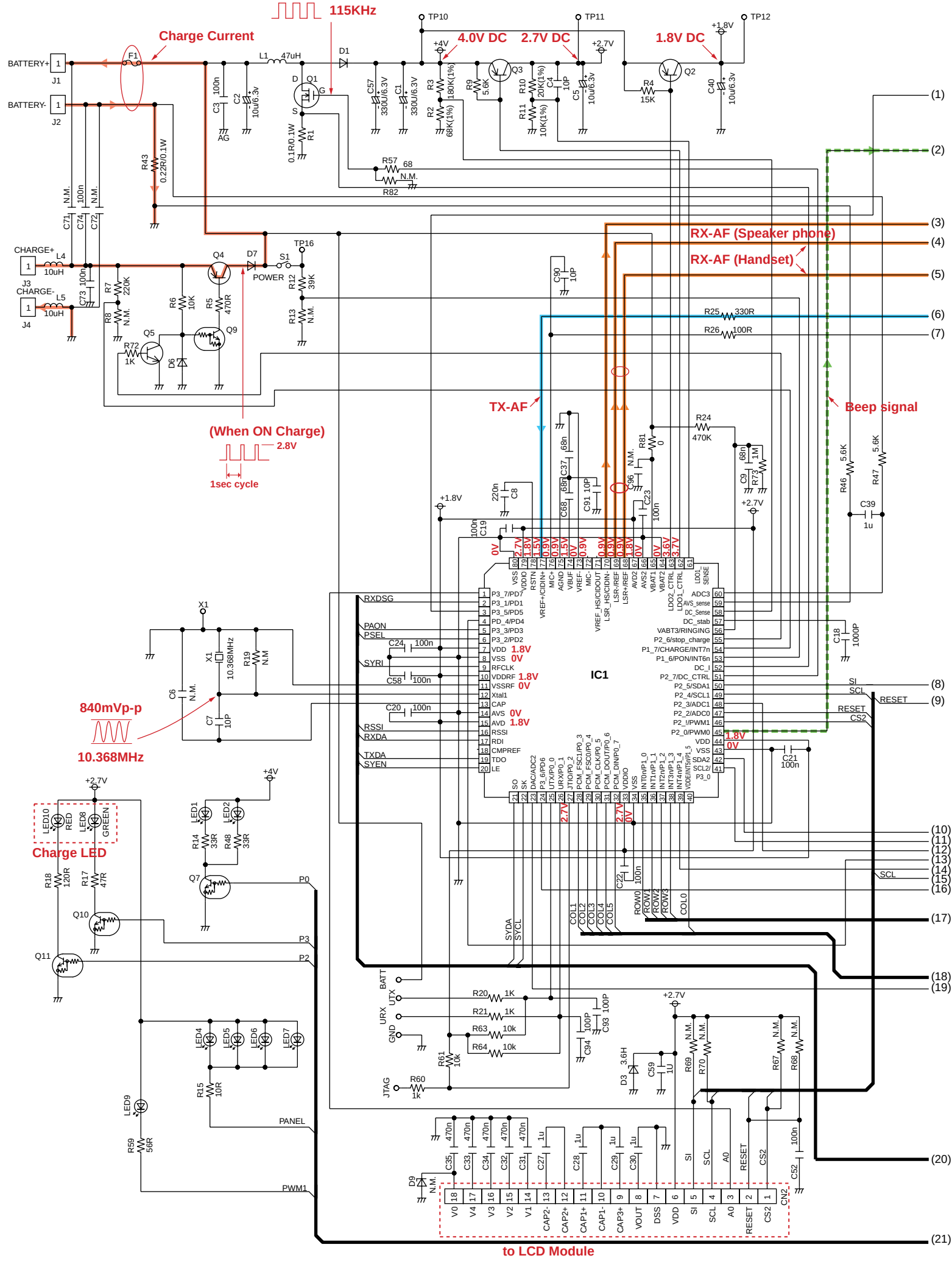

Line Voltage
48V DC (When ON-Hook)
10V DC (When OFF-Hook)
10V DC (When OFF-Hook)
0V DC (When ON-Hook)
RX_AF (When ON-Hook)
Caller ID, Bell Signal
0V (When ON-Hook)
+0.7V (When OFF-Hook)
4.0V DC
3.0V DC
1.8V DC
7.8V
3.9V
2.9V
3.9V
Charge Current
Charge Terminal⊕
Bell Signal
Caller ID at ON-HOOK
0V
3.1V
0V
IC1
IC6
IC7
IC8
Q13
TEL_JACK
DC_JACK
OPTION4
(1)
(2)
(3)
(4)
(5)
(6)
(7)
(8)
(9)
(10)
(11)
(12)
(13)
(14)
(15)
(16)
(17)
(18)
(19)
(20)
(21)
(22)
(23)
(24)
: No Components

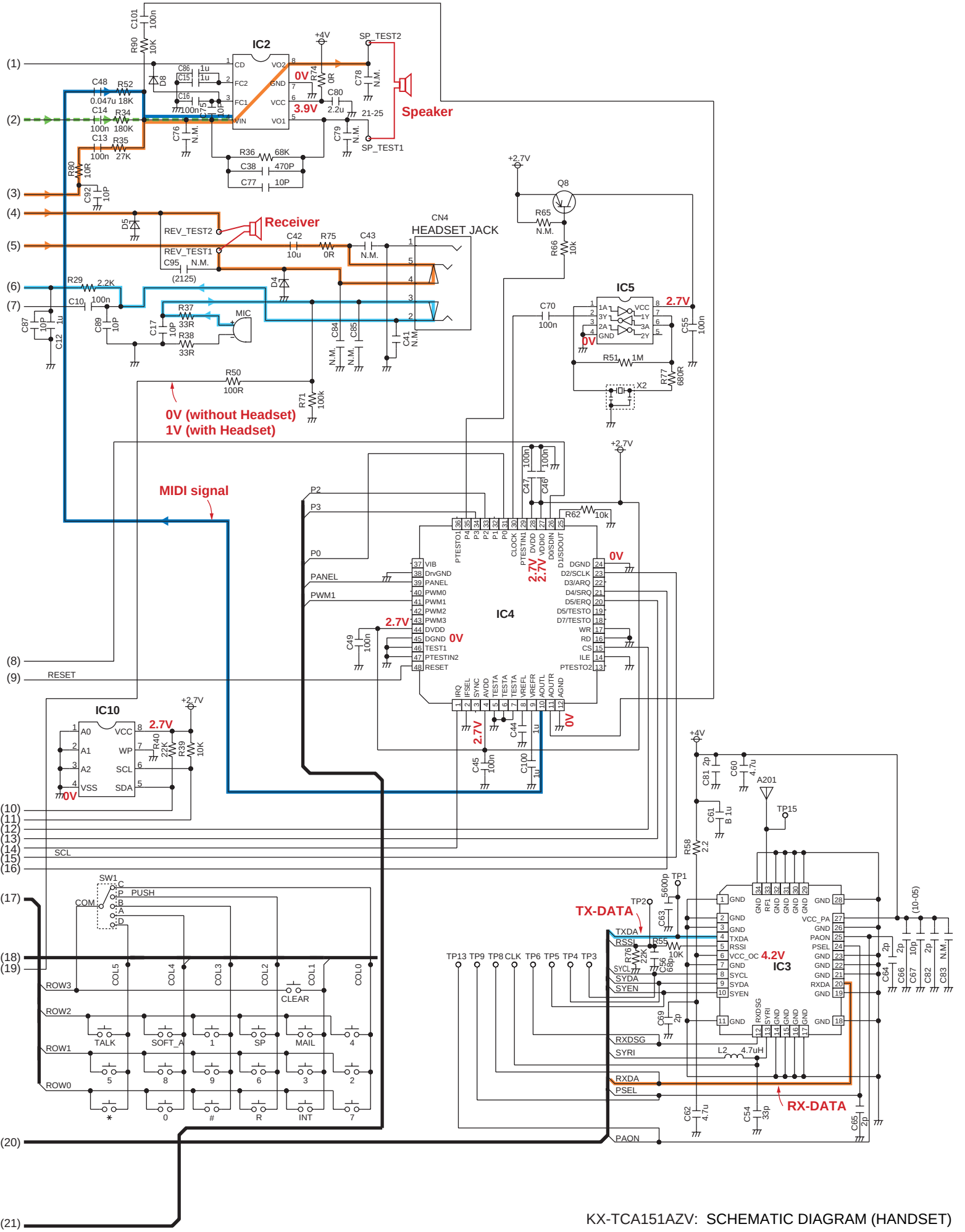


KX-TCD510ALV: SCHEMATIC DIAGRAM (BASE UNIT)

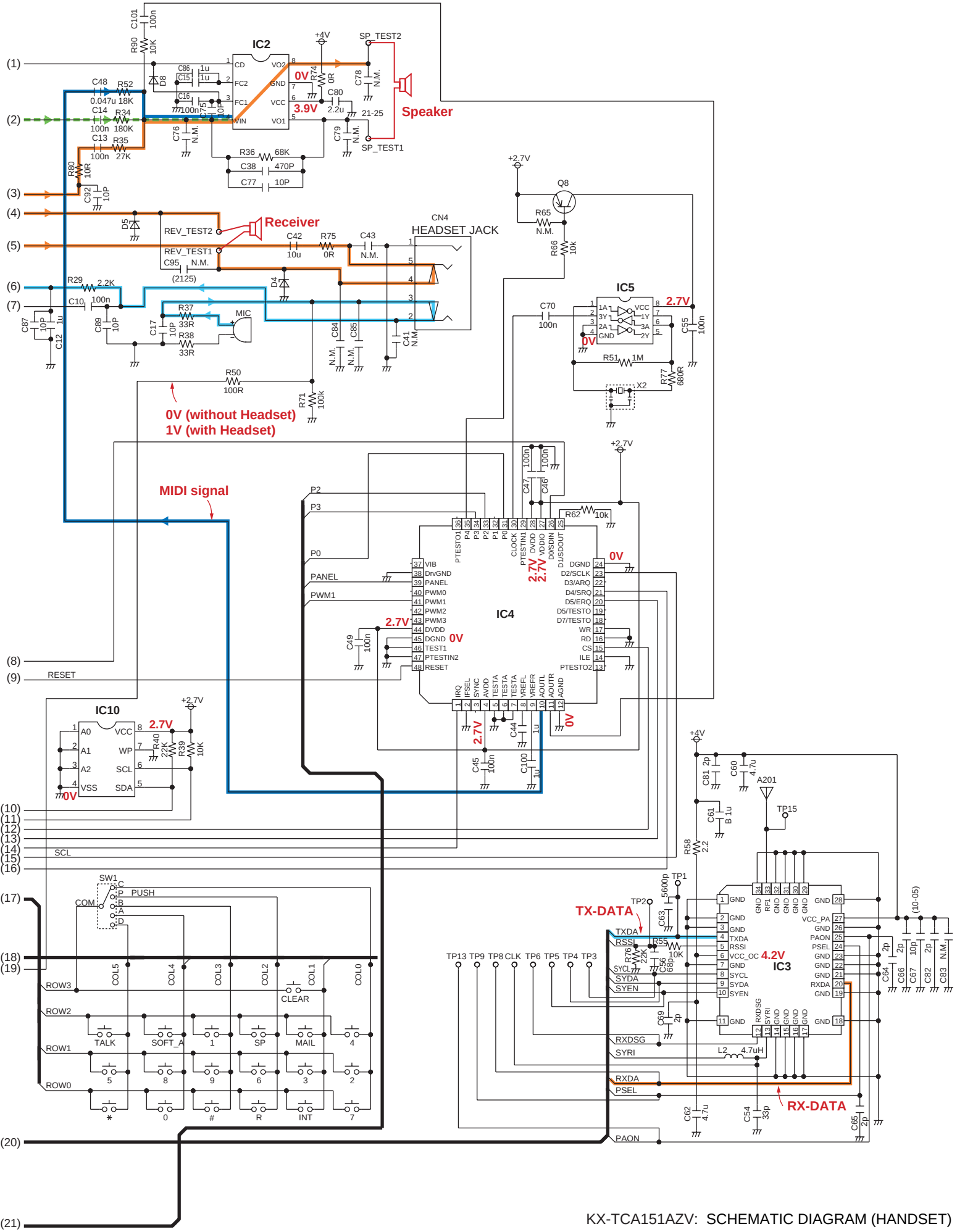


KX-TCD510ALV: SCHEMATIC DIAGRAM (BASE UNIT)

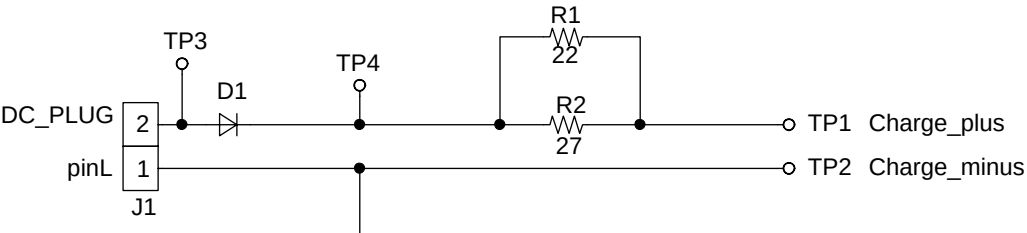

115KHz
Charge Current
TP10
TP11
TP12
4.0V DC
2.7V DC
1.8V DC
BATTERY+
BATTERY-
J1
J2
F1
L1 47uH
D1
Q1
Q2
Q3
R1 0.1R/0.1W
R2 68K(1%)
R3 180K(1%)
R4 15K
R9 5.6K
R10 20K(1%)
R11 10K(1%)
R43 0.22R/0.1W
R57 68
R82 N.M.
C1 330U/6.3V
C2 10u/6.3v
C3 100n
C4 10P
C5 10u/6.3v
C40 10u/6.3v
C57 330U/6.3V
CHARGE+
CHARGE-
J3
J4
L4 10uH
L5 10uH
Q4
Q5
Q9
D6
D7
S1
POWER
TP16
R5 470R
R6 10K
R7 220K
R8 N.M.
R12 39K
R13 N.M.
R72 1K
C71 N.M.
C72 N.M.
C73 100n
C74 100n
C90 10P
(When ON Charge)
2.8V
1sec cycle
RX-AF (Speaker phone)
RX-AF (Handset)
TX-AF
Beep signal
R24 470K
R25 330R
R26 100R
R46 5.6K
R47 5.6K
R81 0
C8 220n
C9 68n
C19 100n
C23 100n
C37 68n
C39 1u
C68 68n
C91 10P
C96 N.M.
R73 1M
IC1
X1 10.368MHz
C6 N.M.
C7 10P
R19 N.M.
840mVp-p
10.368MHz
C18 1000P
C21 100n
C22 100n
C24 100n
C58 100n
C20 100n
RXDSG
PAON
PSEL
SYRI
RSSI
RXDA
TXDA
SYEN
SI
SCL
RESET
CS2
Charge LED
LED10 RED
LED8 GREEN
LED1
LED2
R14 33R
R48 33R
R18 120R
R17 47R
Q7
Q10
Q11
P0
P3
P2
LED4
LED5
LED6
LED7
R15 10R
LED9
R59 56R
PANEL
PWM1
BATT
UTX
URX
GND
JTAG
R20 1K
R21 1K
R63 10k
R64 10k
R61 10k
R60 1k
C93 100P
C94 100P
D3 3.6H
C59 1U
R69 N.M.
R70 N.M.
R67 N.M.
R68 N.M.
D9 N.M.
C35 470n
C33 470n
C34 470n
C32 470n
C31 470n
C27 1u
C28 1u
C29 1u
C30 1u
C52 100n
CN2
to LCD Module
(1)
(2)
(3)
(4)
(5)
(6)
(7)
(8)
(9)
(10)
(11)
(12)
(13)
(14)
(15)
(16)
(17)
(18)
(19)
(20)
(21)



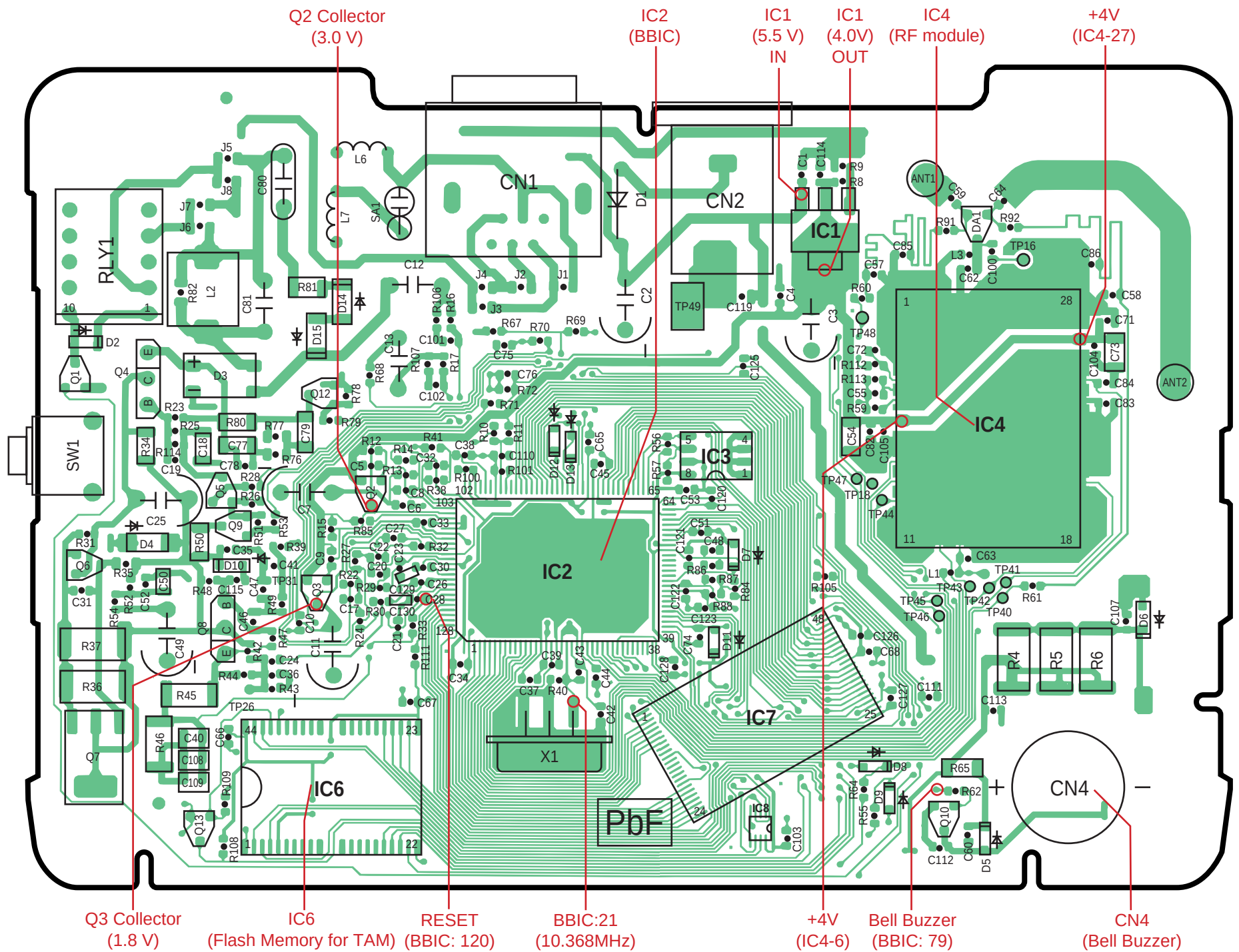
KX-TCA151AZV: SCHEMATIC DIAGRAM (HANDSET)



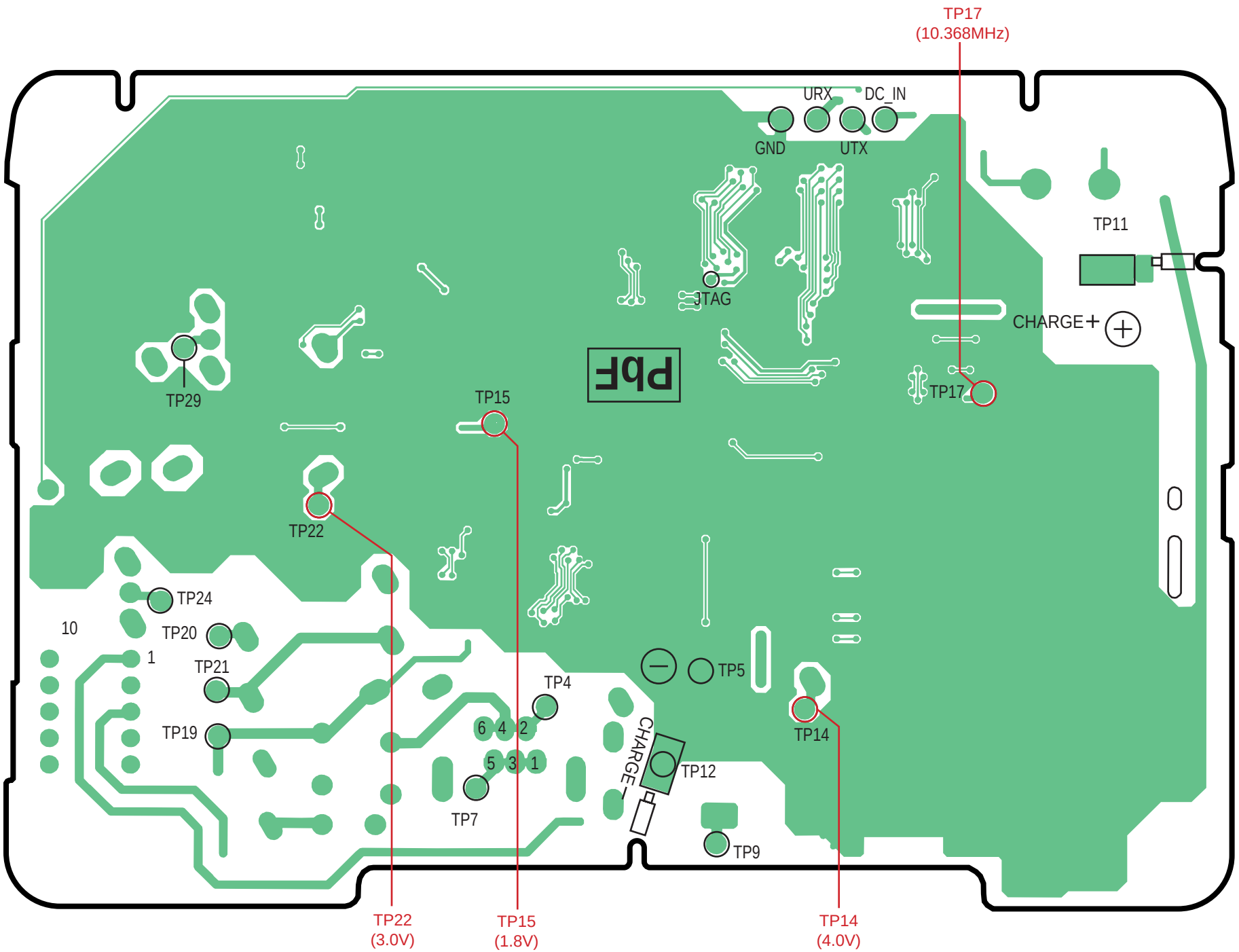
KX-TCA151AZV: SCHEMATIC DIAGRAM (HANDSET)



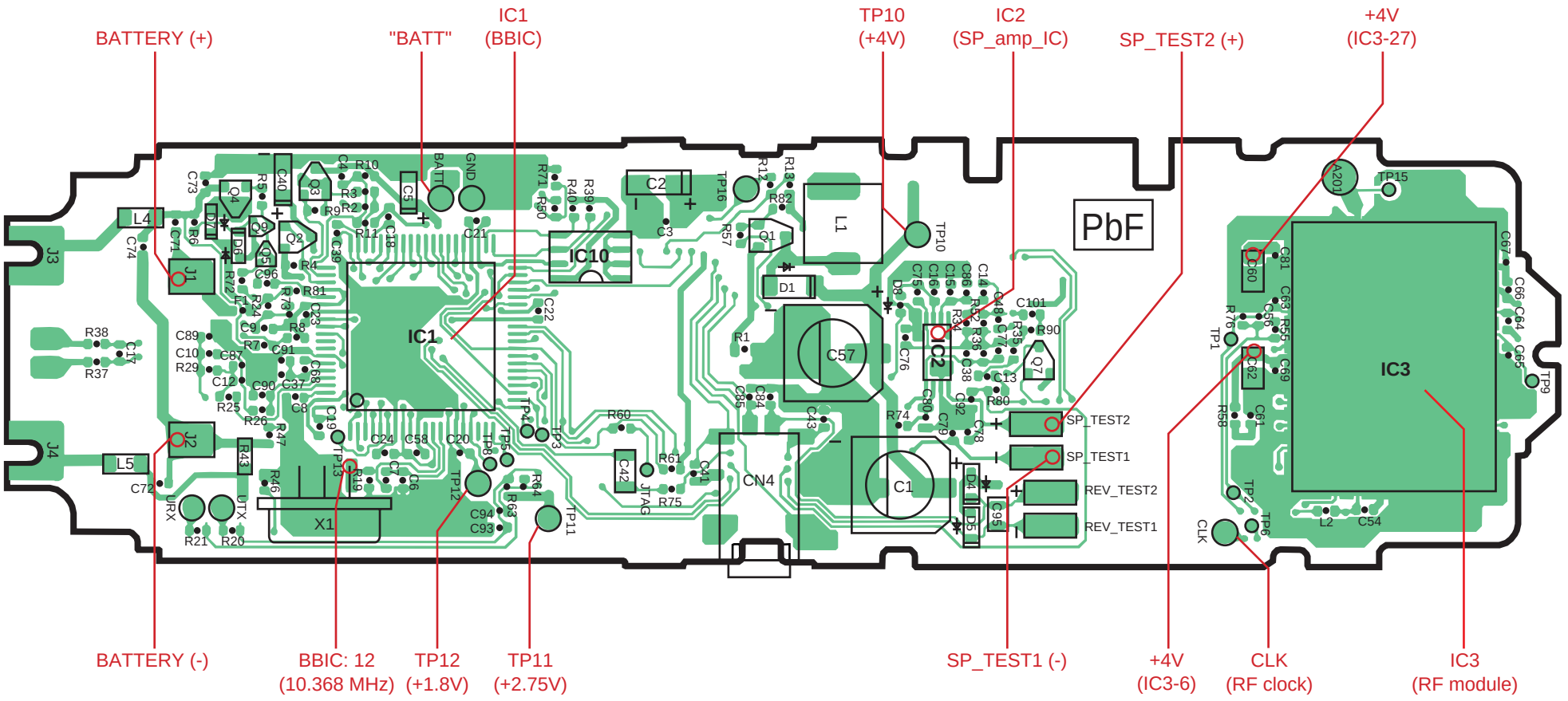
SCHEMATIC DIAGRAM (CHARGER UNIT)



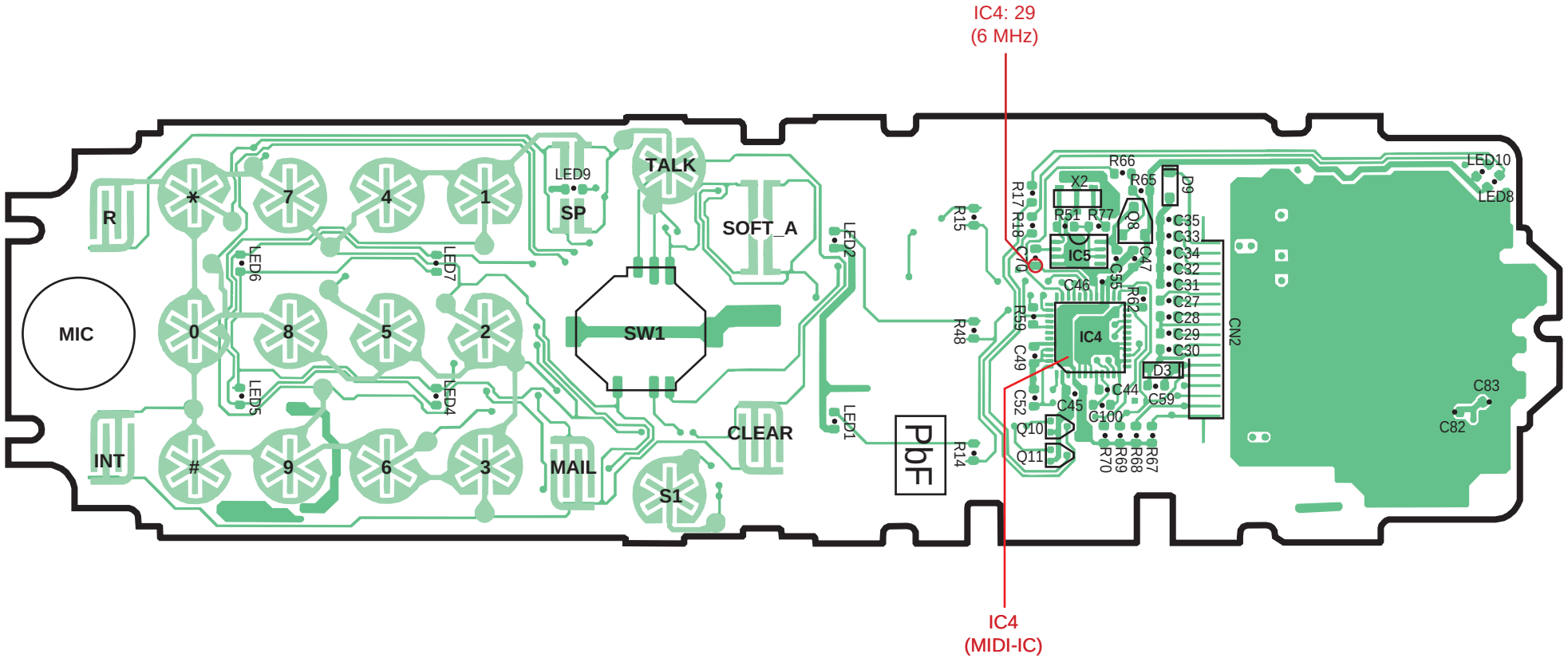
KX-TCD510ALV CIRCUIT BOARD (BASE UNIT) Component View



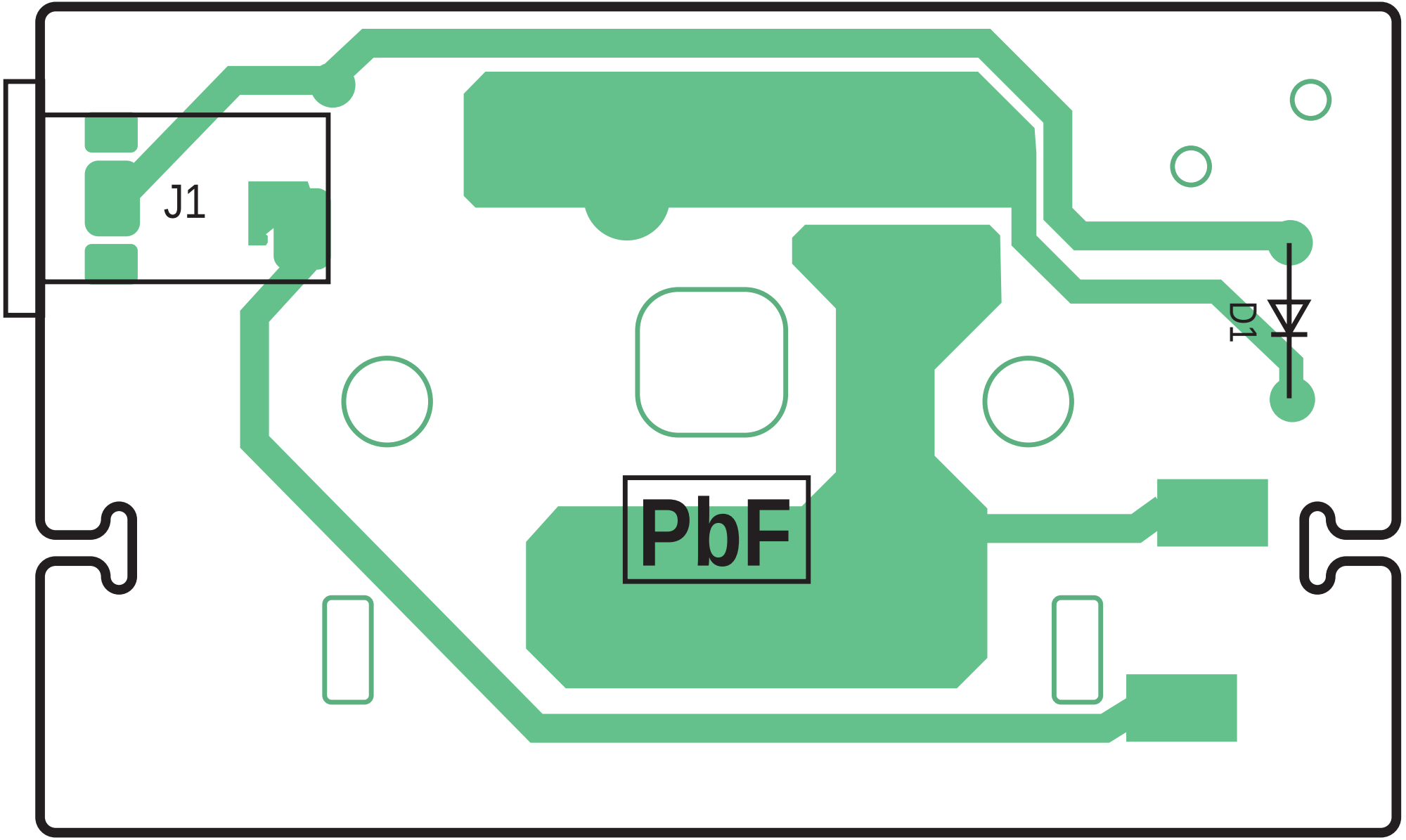
KX-TCD510ALV CIRCUIT BOARD (BASE UNIT) Flow Solder Side View



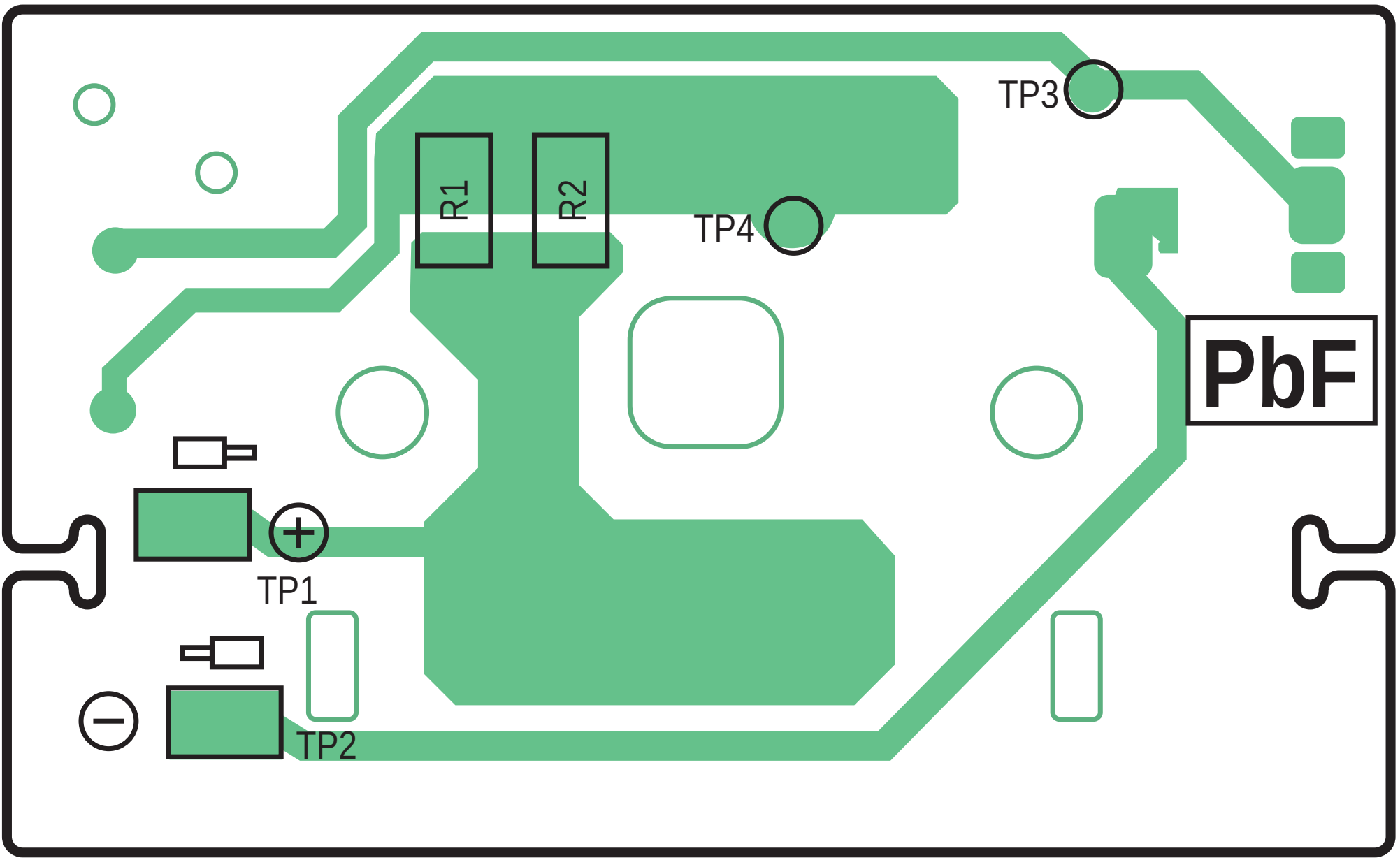
KX-TCA151AZV CIRCUIT BOARD (HANDSET) Component View



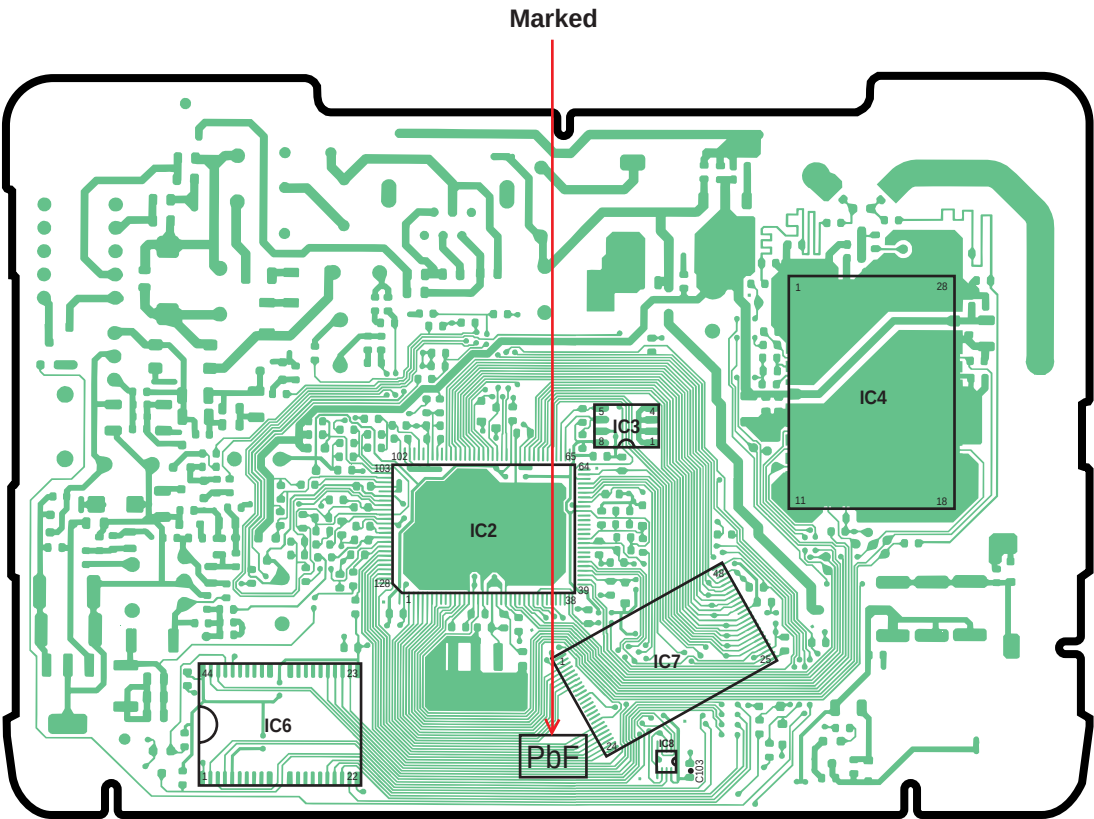
KX-TCA151AZV CIRCUIT BOARD (HANDSET) Flow Solder Side View

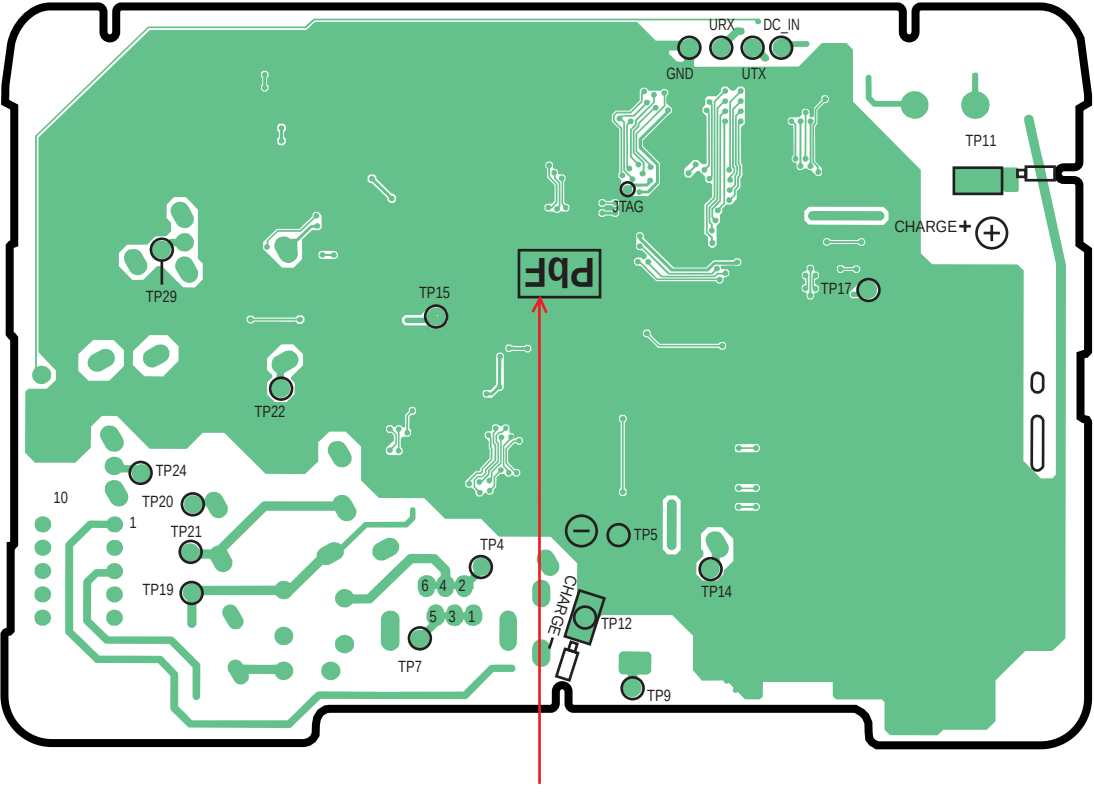


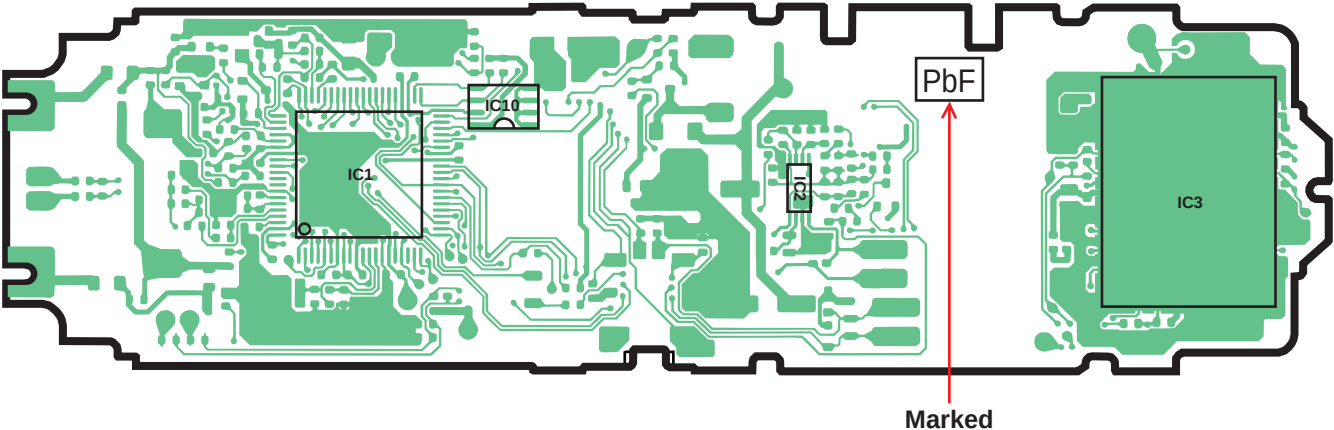
CIRCUIT BOARD (CHARGER UNIT) Component View

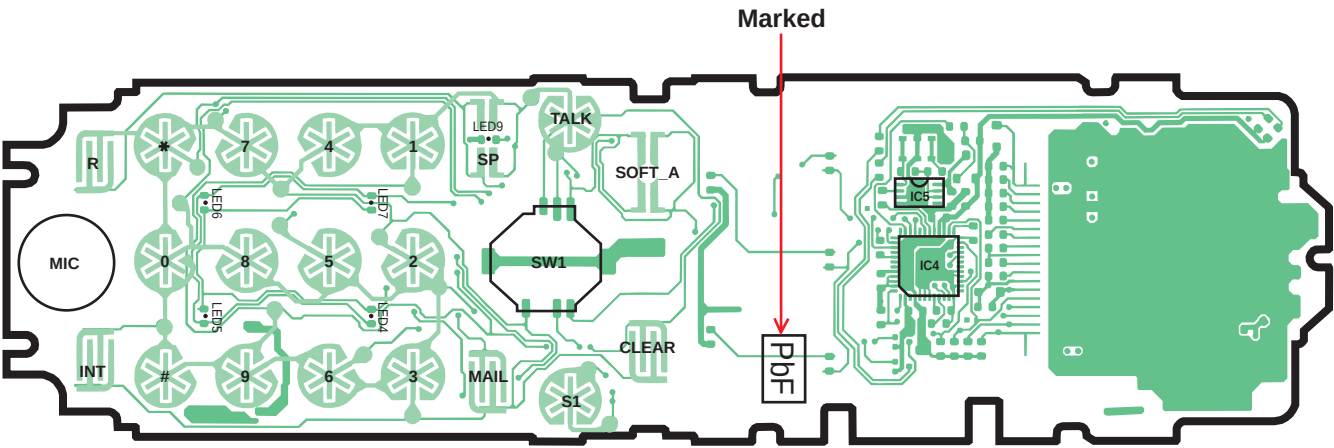


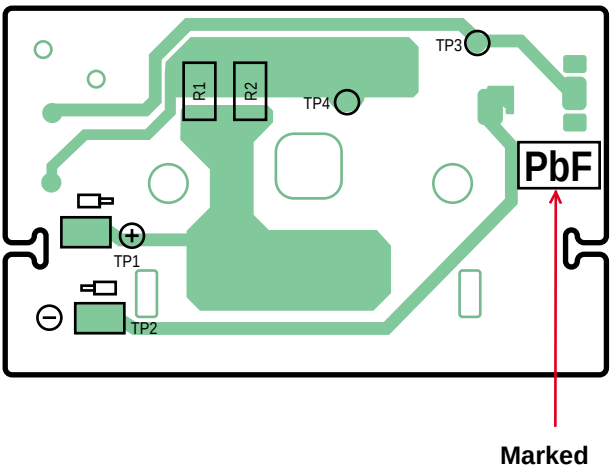
CIRCUIT BOARD (CHARGER UNIT) Flow Solder Side View


Marked
IC2
IC3
IC4
IC6
IC7
PbF
IC5
C303

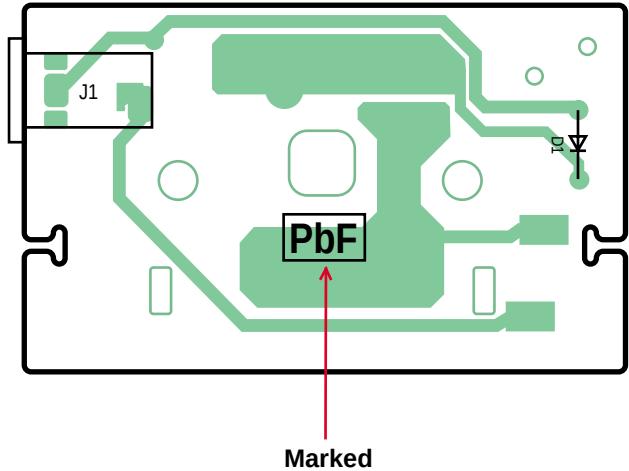

URX
DC_IN
GND
UTX
TP11
JTAG
CHARGE+
TP29
TP15
PbF
TP17
TP22
TP24
10
TP20
1
TP21
TP19
TP4
6 4 2
5 3 1
TP7
TP5
TP14
CHARGE-
TP12
TP9
Marked


PbF
IC1
IC10
IC2
IC3
Marked


Marked
R
*
7
4
1
LED9
SP
TALK
SOFT_A
LED6
LED7
MIC
0
8
5
2
SW1
IC5
IC4
LED5
LED4
INT
#
9
6
3
MAIL
S1
CLEAR
PbF

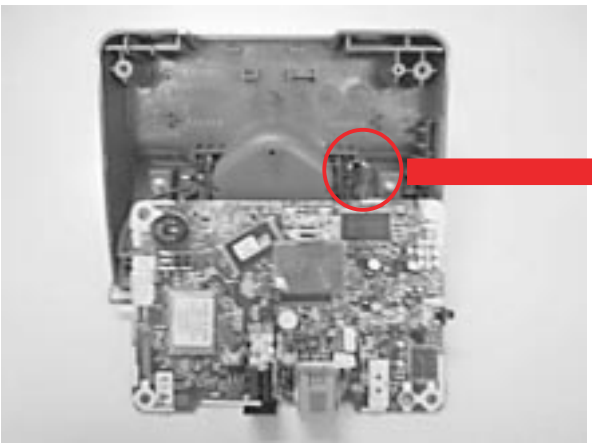


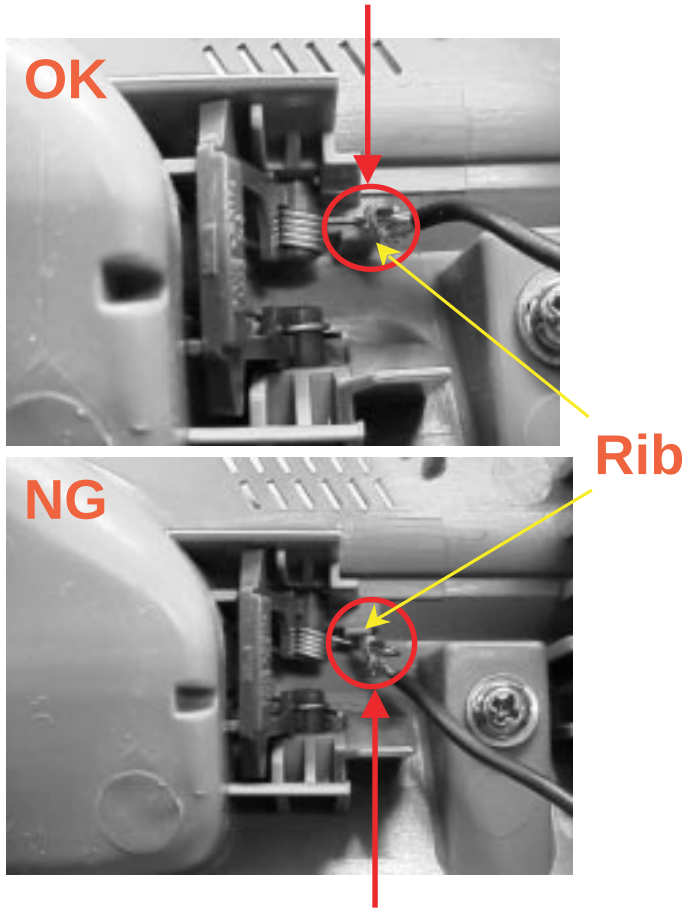
(Component View)



(Flow Solder Side View)

CHG terminal is properly fit in the cabinet.





CHG terminal comes out of rib by pulling black lead wire when opening the cabinet and turning the PCB over. The terminal cannot have enough elastic force, cannot have good contact with handset, and it will result in charge problem.